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Some Common Conditions met with in Practice.*

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In choosing the above subject for my paper, I have endeavoured to bring forward a few notes on conditions with which we, as country practitioners, are all familiar. I hope, therefore, that each one of you will join in the discussion and give us the benefit of your experiences. The notes are very brief, in the hope that they may be the more interesting; nevertheless, I trust they do not lack the detail necessary to enable them to be clearly understood, and will afford sufficient ground for a good and useful discussion, to atone for my omissions.

Fracture of the Mandible of the Dog.

This subject is not, perhaps, strictly in keeping with the title of my paper, but it is a condition with which any practitioner may be called upon to deal at any time, and a recent case, of double fracture in a valuable greyhound bitch, prompts me to give you a few notes on my procedure. The ramus was fractured on the right side just in front of the carnassial tooth, and the body one tooth to the right of the symphysis. The floor of the mouth was torn, but there was little laceration of the gums. The tooth in front of the carnassial was laid bare, but was still firm and so not removed. The accident happened, presumably, through a puppy, with which this bitch was kennelled, getting hold of the right ramus in its mouth and rotating it so that the teeth, instead of being erect, were lying flat and projecting from the lips.

She was given morphine gr.ii at 7.15 p.m. and Avertin rectally (weight 44 lbs.) at 7·45. The morphine seemed to have little or no effect upon her. At 8 p.m. she was put on the table and, with an assistant keeping her mouth open with his hands (no restraint at all was used) the fracture was reduced, and the parts wired into position with silver wire. Commencing with a loop around the carnassial tooth pressed well down into the gum, the wire was passed forward in and out between the pre-molars in the broken bone to the canine, which was encircled by it, and it was then carried across the incisors as low down as possible, to the other canine, around which it was passed, and finally across the bar of the mouth again to encircle the canine on the right side.

Thus, the fracture of the body was firmly held, and so was that of the ramus as long as nothing was gripped with the teeth. The operation took about a quarter of an hour, and at 8.30 (half an hour after the commencement) the bitch was able to walk about and quickly recovered from the anæsthetic. The next day she took milk and sloppy food, on which she has been kept since. She did not take the least notice of the wire, kept in excellent spirits and barked normally all the while. The wire was removed in twenty days, as the union seemed firm. Although she has not yet been allowed any solid food, the jaw seems as strong as ever, and, except for slight enlargements at the seats of fracture, which can be felt from the outside, there is no evidence that the jaw had ever been broken.

Avertin and Spinal Anæsthesia.

Having mentioned Avertin anæsthesia, a few notes on this subject may be of interest, although I can only endorse enthusiastically reports already published by Professor J. G. Wright, (*Veterinary Record*, June 14th) and others.

In the case of the bitch above-mentioned, morphia seemed to have no effect at all, but Avertin worked well, and produced a state of complete anæsthesia such as could only have been attained formerly by inhalation, and for this case any form of muzzle would have been a hindrance, to say the least. Yet, with Avertin, she made no movement at all and was certainly not the least conscious of anything happening to her.

When she was put on the table a quantity of the fluid escaped, which probably accounted for her quick return to consciousness, although the period of anæsthesia varies in the dog. In the cat it is more consistent and safer than any other anæsthetic, in my opinion, as well as easier of administration and much more agreeable to the patient; in fact, the sensation appears to be a delightful one.

In kittens sometimes only a deep narcosis is obtained, sufficient for most operations, but a little chloroform may be necessary for abdominal operations such as speying, etc., although in cats Avertin produces a state of deep anæsthesia, so that restraint is absolutely unnecessary even for major operations. Further, cats remain under its influence for twenty to thirty hours; thus one has time to clean up and effect one or two dressings, if necessary, before complete consciousness is regained. In aged cats, as with any anæsthetic, the risk of accident is greater, but, provided the patient is healthy and not obese, I do not consider age increases the risk very much, if at all.

I have endeavoured to show how profound is the anæsthesia produced by Avertin, which is such that one might become alarmed at the apparent lifelessness of the patient, but, provided it is kept properly warm and comfortable until consciousness returns, I do not think there is any need for alarm in a healthy subject.

I have purposely omitted details of dosage and administration, as they are clearly and fully given in the paper by Professor Wright.

While on the subject of anæsthesia, I should like also to mention how extremely useful spinal anæsthesia in cattle can be for even major operations to the udder, hind limbs and feet, as well as for parturition and prolapsus uteri. For these latter cases, when the standing posture

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is often more desirable, I have found that doses of 10-15 c.c. of Codrenine or Parcaine will cause greatly diminished sensibility and less straining on the part of the patient, together with temporary paralysis of the tail, but without the patient going down, as it does with larger doses. The technique is well known to you, and so will not be reproduced here.

Prolapse of the Uterine Horn in the Cow.

Having alluded to this condition, I should like to say that I do not consider it is necessary to apply a truss or any other device to the vulva after replacement of the uterus, as, having treated more than 20 cases in this way, I have not had one in which the condition has recurred. Observation of these cases has shown that there is no straining of any consequence provided there is no inversion of the horn, and if the organ is not comfortably in position and lying naturally, it might just as well be re-everted immediately, as the next time it will go back easily and, most probably, correctly, and so cause no further straining.

Foul of the Foot, or "Claw-Ill," in Cattle.

While at this end of the cow, a few notes on this subject may be of interest and stimulate a discussion from which we all may benefit, as, although so commonly met with in practice, this condition is often a difficult one with which to deal. I refer especially to neglected cases, and those where one is presented with a very painful and swollen foot with the claws forced widely apart and in which there may, or may not, be evidence of suppuration or softening. In the latter case I advise repeated foot baths and linseed or Kaolin poultices to relieve the pain, and to endeavour to soften the skin over the necrotic or suppurating area, so that it may be opened, curetted and disinfected with Tinct. iod. fort. or undiluted Acid carbol. But, even when this is done very thoroughly and as much drainage as possible given, one sometimes gets other centres which burst or have to be opened around the coronet, with subsequent sinus formation, each of which is thoroughly curetted and disinfected, and the foot soaked as often as possible in hypertonic saline solution and kept poulticed between the baths, while the sores or sinuses are dressed daily with a solution of iodine or a lotion of equal parts turpentine and rape oil and an eighth part of creosote.

For a commencing or simple case, I find that an ointment of the three sulphates smeared between the claws, and the foot kept clean and on a hard, dry surface, will often cause a disappearance of the symptoms in a short time without the formation of a slough or core.

I have lately been using Bier's treatment, with excellent results in some cases, and owing to the low vascularity of the affected parts, I think its adoption is indicated. Nevertheless, in spite of all measures, one still gets cases in which the progress of the disease cannot be arrested except by amputation of a digit or digits, or even the whole foot from the fetlock joint. This I have done in two cases, and the cows have milked well afterwards and then been grazed.

I would like here to dilate a little and say that I think we might use Bier's treatment a deal more often in all foot cases, injuries and obscure lamenesses of the lower limbs, together, of course, with other appropriate treatment for the case, and get better and quicker results. The object of the treatment, as you know, is to increase an already existing hyperæmia and so flush the affected area with an excess of serum, and to increase cellular activity. Thus we may be almost empirical in its application, and yet always be assisting nature.

The method of application is so well known that I need not elaborate it, but care must be taken to ensure that venous stasis only is produced. There must be no arterial compression, and to guard against this one should be able to feel pulsation in the artery distant to the compress, or, if the part be swollen or œdematous, the patient's comfort is the only guide and a reliable one, as arterial compression very quickly causes discomfort.

Hygroma of the Knee in Cattle.

This is a condition with which we are all familiar, whatever its origin may be, and I am convinced that the most satisfactory way—if not the only way—to deal with it is to incise the swelling for the greater part or whole of its length (depending upon the extent), break down all the adhesions and leave alone. If the swelling is opened in this way, there is no fear of the skin healing too early and the cavity refilling, nor does it require any further attention, whether the patient is housed or at pasture. This applies, of course, only to those cases in which the skin over the swellings is still apparently normal and not blemished by any horny growth, and of these latter cases I have no knowledge outside the museum, but I have successfully treated in this way hygromata extending from the middle of the fore-arm to the middle of the cannon, and about the size of my head, at the knee. The wound takes four to eight weeks to heal, but it does not seem to inconvenience the patient at all in that there is no lameness, loss of flesh or diminution of the milk yield in a milch cow.

One word of warning may be necessary, in that occasionally one gets a deal of hæmorrhage in the larger swellings, which may be alarming, and, owing to the thickness of the skin, ordinary artery forceps are of no use to control it, so that when one is about to perform this operation, two or three pairs of plumber's pincers or smith's tongs should be provided to compress the vessels while they are seared. The knee may then be bandaged for twenty-four hours to support the vessels, but after this time bandaging is not necessary or advised.

Recent reports associate *B. abortus* with hygromata in many cases, so that vaccine treatment may be suggested, but I have not tried it, and must confess I should not have much faith in it, alone; while, together with operative measures, I think it unnecessary.

Actinomycosis and Actinobacillosis.

Not claiming to be able to differentiate between these two diseases clinically, I have coupled them for the purpose of the few remarks I wish to make on conditions and lesions which we familiarly associate with them, and I propose to limit my remarks to the head of the ox, as being most important to the clinician, but any observations concerning these diseases in other regions or animals that any one may wish to make will be of interest.

I think it is generally agreed that, as far as possible, lesions due to these causes should be treated surgically,

but surgical treatment is necessarily limited to a part from which or with which they can be completely removed with the knife, incised and treated by direct application of iodine—strong tincture—or by injection of iodine into and around them. The disease in the tongue, therefore, has to be treated locally and systemically, the usual drugs, as you know, being Pot iod., and Hyd. sod. rub., either singly or in combination, or the latter with Pot nit., sodii. cit., etc., and given in powder form on the tongue or dissolved in water and drenched night and morning until symptoms of iodism appear, when the dosing should be suspended for a few days and then resumed, until at least one month's treatment has been given.

Formerly I was fairly certain of a favourable result in cases of so-called " wooden tongue " treated in this way, when the tongue alone was affected, but recently I have had cases that respond promptly to iodine treatment and keep well as long as it is continued, but become just as bad within a few days of its discontinuance. In these cases I have found iodised salt licks contain sufficient iodine to keep the disease in check after the symptoms from dosing have disappeared, but which disease would most certainly and promptly return if no extra iodine were taken by the patient daily. I have seven cows now that keep perfectly well while housed and provided with these licks, but which begin to dribble in two or three days if turned out. Further, the disease does not appear to create a desire for iodine in the same way that in cows giving a heavy milk yield, or on a diet deficient in minerals, a desire for them is caused, as cows affected with " wooden tongue," if provided with these licks at pasture, take little or no notice of them, whereas cows giving a large milk yield and provided with mineral licks show almost a craving for them. Therefore, even with these licks it is usually necessary to keep the patients housed by day or by night, but it saves continual dosing.

In one case in which even large and increasing doses of iodides, given continuously for three weeks, caused little improvement, " Alival " (Bayer), subcutaneously, brought the case under control, and further oral dosing caused a disappearance of the symptoms, but this is one of the cases mentioned above in which extra iodine daily is necessary to prevent recurrence.

Swine Erysipelas?

Under this heading I do not wish to deal fully with this disease, as you will imagine, but merely to give a few notes on a disease affecting recently-farrowed gilts which I had not met until this spring, since when I have had nearly 30 cases, and probably an equal number occurred in the district, but about which I was not consulted.

Except for one case in a sow with her second litter, all the subjects were gilts, but in every case the disease showed itself when the piglets were five weeks old. In no case were the piglets, sows or other pigs on the same premises affected, and the trouble appeared in the cottager's as well as in the farmer's gilt, and therefore, under all conditions of hygiene, feeding and management.

The symptoms were few, but constant. The subject was invariably left perfectly all right at night, and the next morning would be found down, lying flat on the side, and at the approach of any person would yell like a pig under a gate—apparently in fear of being moved or touched and obviously in pain. The appetite was completely lost, but the bowels were fairly normal. Temperature 104-105° F. No cough, and breathing normal, except when disturbed. If lifted up, the patient refused or was unable to stand, and would keep the legs flexed, and when let down on the ground it refused to sit up on the sternum. The milk, of course, was soon lost.

I think I tried everything in the way of drugs likely to be of any use internally, and locally to the back, knees and hocks, together with strychnine, " Omnadin " and " Aricyl " (Bayer), subcutaneously, with no apparent effect. I think I omitted to use what might have been of service, *viz.*, Swine Erysipelas Serum, but as this suggestion was only made to me at the Congress, and I have not had a case since, I have not had an opportunity to try it.

The results were varied. Some owners became impatient and had the gilts butchered without, of course, informing me when or where, so that I made no *post-mortem* examinations. Others let their gilts take their chances and most of these recovered in three to six weeks. Those that did not fully recover regained their appetites, but were permanently partially paralysed, still retaining control of their bladders and recta and able to sit up like dogs on their haunches, but quite unable to stand even when lifted up. These, too, were butchered after the mammæ returned to normal and they had improved in condition.

Your help and advice in these cases, by a full discussion, will be appreciated and helpful for all.

Discussion.

Mr. H. W. Townson congratulated the essayist on the production of an instructive paper, and on his successful treatment of the fractured mandible of the dog, in which case Avertin proved its usefulness as an anæsthetic.

He asked for further details as to spinal anæsthesia in the cow. With regard to the treatment of actinomycosis, he thought that potassium iodide was the only dependable agent, and that it was much to be preferred to biniodide of mercury. He was interested by the reference to " Alival " in cases which did not respond to ordinary treatment. Occasionally one saw cases, even affecting only the lips and cheeks, which did not respond to treatment. No reference had been made to the disease and its treatment when it involved the jaw bones. He had tried various remedies including the injection of Tr. iodi, blistering and burning with acids, but he thought the butcher's knife was the best remedy in cases which were in fair condition when caught early.

In cases involving the tongue, the daily application of an iodine lotion to the tongue was very useful.

In connection with the treatment of hygroma of the knee, he observed that, whatever was done, infection must be guarded against. He thought the cause of the condition was more likely to result from friction with the ground than from the presence of *B. abortus*. One might puncture after the application of a kaolin poultice, open freely or point fire. Mr. Bovett's operation seemed somewhat terrifying and would hardly be warranted in ordinary cases.

The great thing in connection with the treatment of " claw-ill " was to keep the dressing in contact with the parts. It was no good if the animals were always paddling in the field. He applied a poultice for a day or two, and then applied either BIPP or a lotion containing turpentine and lysol. He doubted if amputation of the foot would be an economically sound principle.

Concerning eversion of the uterus, Mr. Townson did not agree with the essayist when he said that if the organ was properly replaced there was no straining and therefore

no need to insert sutures. However satisfied he felt about the operation, he would not feel happy to leave an animal without something in the way of sutures or a truss being applied to the vulva. He gave chloral in these cases, and in those cases which did not respond as one would wish, there was a considerable amount of straining for more than an hour after the completion of the operation, it being necessary to keep the folds of the uterus in position for 10 to 15 minutes. A clamp or sutures could be safely and quickly applied and they gave security to one's client and one's self.

Mr. C. Masson mentioned a Yorkshire terrier which sustained a fracture of the lower jaw while it was being very gently handled. The jaw had been eaten away by pyorrhœa. The lower jaw was supported by a tape carried around the upper and lower jaws, and a good recovery was made. A second case resulted from a dog rushing into an object and fracturing the lower jaw behind the canines, the piece being displaced backwards. A tape was passed around the jaws behind the canine teeth, and the piece was drawn forward. The broken ends dropped into position with a click, and the case recovered without further interference.

He had not been very impressed by what he had seen of spinal anæsthesia in the cow, and he thought it was not of much use. One cow rolled about for hours afterwards.

If a uterus was properly replaced, there was probably no need to do so, but he usually put on a clamp.

"Claw-ill" cases were difficult to treat. He used a mixture of turpentine, oil and creosote.

With regard to hygroma of the knee, he was very shy of opening some of these, on account of the serious bleeding sometimes encountered. Rubbing on the ground would start bleeding, and he remembered one case which bled until the mucous membranes were quite blanched. The cow lived, but her udder went dry. He was interested in the iodine licks to which reference had been made. In some relapsing cases of actinomycosis the tongue would become large in twelve hours. He had tried vaccine in cases of actinomycosis, but it had not been very satisfactory. He had seen similar cases in pigs to those mentioned by the essayist, but they differed in that his cases were willing to feed. Bone meal fed to these pigs put them right in a week.

Major W. Ascott observed, in connection with anæsthetics in dogs, that he used H.C.M. tablets, often helped by a little chloroform. Morphia was uncertain in its action on dogs.

He had seen dislocation of both articulations of the lower jaw in three cats. Reduction was simple. A pencil was placed across the teeth and the jaw was levered into position. Recoveries were uneventful.

As to eversion of the uterus, cases of this kind were more easy to deal with than some cases of protrusion of the vagina. The latter sometimes assumed the size of a man's head. He usually gave chloral and liked some means of retention, such as a stick placed on each side of the vulva, to which tape sutures were fastened.

For controlling hæmorrhage in cases like opening hygroma of the knee, he found a large pair of bitch parturition forceps very useful.

Mr. R. H. Smythe advocated the use of ordinary motor insulating tape for the purpose of setting jaws in dogs. Tape wound around the teeth and jaw answered well. If necessary, a piece of tape could be wrapped around the muzzle, leaving play enough for the dog to get his tongue out to take liquids. Dislocation of the lower jaw in the dog was liable to recurrence. He wondered if any work had been done in connection with spinal anæsthesia in the sow. Recently he injected two grains of cocaine in 3 drs. of fluid between the "pins" of a sow in the hope that it would reach the spinal canal. Half an hour later the sow was recumbent and her uterus, which was prolapsed, was tied and cut off. The sow recovered.

"Claw-ill" cases, with sinuses at the coronet, did not do well, except by the application of repeated blisters.

Mr. J. Willis Thwaite said that, with the aid of Parcaine as a spinal anæsthetic, half a dozen ropes and a Danish embryotome, one could calve almost any cow. He referred to three cases of torsion of the uterus in which the twist was straightened, but in which the *os uteri* would not open, and asked if anyone knew of a means of causing the *os* to open in such cases. Spinal anæsthesia was excellent for protrusion of the vagina or uterus. It was a "toss-up" between chloral and this method of anæsthesia. As to actinomycosis in the form of "wens" under the lower jaw, if a deep incision were made, pus was usually found in the enlargement, and if a piece of tow soaked in sulphuric acid was then packed in, the cases usually cleared up.

Mr. A. R. Smythe said he had used silver wire to suture fractured lower jaws. There was usually some suppuration, but it did not appear to involve the bone.

He had not had much experience of Avertin, but why leave morphia, or twilight sleep *plus* chloroform, for the dog, and chloroform and ether for cats? Ether, if properly used, was safe for cats. There was a slight mortality in cats, but it was very small with ether. There was a mortality with Avertin, but he did not know the percentage. Avertin did not absolutely remove reflexes—a disadvantage in some cases.

He thought hygroma of the knee was best left alone. With regard to West's Clamps, there were many things as good and perhaps better. West's Clamps were liable to cut and cause sloughing if left long in position.

After replacing a uterus, the insertion of a 26-oz. bottle was often very useful.

Mr. F. T. Harvey (St. Columb) said he had wondered if, in the last thirty years, the organisms connected with actinomycosis had acquired a tolerance for iodine. Recurrences were much more common now than formerly. He did not often use biniodide of mercury; animals sometimes died from mercurial poisoning some time after the administration of the drug had ceased. The late Mr. John Dunstan gave up using it because of the danger connected with its administration. He asked what was a safe dose to be repeated daily for two or three weeks? He suggested that bismuth might be useful in some of these cases. He had seen cases of actinomycosis of the jaw become quiet after the use of bismuth paste. It had been pointed out that the thyroid gland of cattle contained no iodine, and he wondered if that might be the reason for the susceptibility of cattle to actinomycosis.

As to the use of sutures after replacing the uterus, if the horn were properly replaced it rarely came out again, but on occasion it did, and the insertion of sutures might save trouble. He was indebted to Mr. John Brown, of Invergordon, for an idea in connection with sutures for the vulva. It was the use of bull-rings for the purpose. The vulva was punched and the rings were inserted. If necessary, they could be left in position for months. For some cases of "claw-ill," Bier's treatment was good. In cases where poultices were required, potato poultices were useful. Cattle which had one claw removed could travel well.

Mr. Forbes remarked that there was very little risk of the uterus coming out again if it were put back straight. Especially in fattening cattle, he thought hygroma of the knee was best left alone.

Mr. W. L. Richardson said that, although in some dogs morphia did not act, on the whole it was quite good. He considered A.C.E. fairly reliable for cats.

In one-sided fractures of the lower jaw in dogs, bandages had not been necessary in the cases he had treated.

After replacing the uterus he inserted hip sutures of unbleached tape.

Mr. R. E. L. Penhale remarked that for cases of "claw-ill" he had found baths of perchloride of mercury, followed by the application of benzoin, quite good. If there was much straining after replacing a uterus, he administered chloral hydrate.

Mr. R. Barons Nelder observed that after replacing the uterus he inserted brass wire clamps, which could be left in position a long time, and the cows could be served through them. Mr. Frazer read a paper some time ago in which he referred to actinomycosis of the skin. It took

the form of huge areas, as large as plates, on the back. This form responded in two or three weeks to the administration of potassium iodide. With regard to "claw-ill," he did not like the use of blisters and caustics; they often did more harm than good. He preferred the use of poultices and antiseptics.

Major W. N. Wright said that fractures of the lower jaw in dogs should not be left alone if there was displacement.

Morphia acted well in most dogs. He used morphia, and, if necessary, chloroform, which he administered through a Hobday's inhaler, but he thought Avertin was the anæsthetic of the future. He agreed with the use of trusses or sutures after replacement of the uterus in cows. No one had mentioned raising the hind quarters after operation; he thought this was useful.

For "claw-ill" in cattle he used an absorbent antiseptic poultice (Ouataplasme) after curetting, if that were necessary. For serious deep-seated bleeding, such as might occur in connection with hygroma operations, he used a bullet forceps, an instrument which he also found useful in whelping cases.

Mr. S. J. Motton said he had given up the use of morphia in dogs for many years. He thought it usually acted, but not always in the direction intended. He had met with a number of dogs which became very hysterical after the injection of morphia.

As to the setting of lower jaws in dogs, when there was a reasonable depth of intermaxillary space this could often be filled with pitch plaster strengthened by a triangle of linoleum or some similar substance, and cases so treated appeared to do quite well.

The Reply.

Mr. Bovett thanked the members for discussing the paper freely. He was very grateful to Mr. Townson for opening the discussion. During the discussion many of the questions asked had been answered for him. Cats certainly remained a long time under Avertin. This was sometimes alarming, but if they were kept warm, although accidents certainly did occur, they were uncommon.

He found Avertin extremely useful, especially when operations had to be carried out with few people to assist.

As to the technique for spinal anæsthesia in cattle, he referred members to the *Veterinary Record* of January 11th and April 19th of this year. The injection was made in the first intercoccygeal space. It was a useful method for operations on the feet, hind legs, and udder. For wounds on the teats he used a method which he had seen recommended in the *Veterinary Record*, *viz.*, the insertion of a large bougie and then bandaging the teat with adhesive tape.

With regard to actinomycotic "wens" or "clyers," he thought the best treatment was their surgical removal. In actinomycosis of bone the animals were best butchered.

With regard to suturing the vulva after replacing the uterus, he had not yet had reason to regret his practice of not inserting them.

Mr. Masson had said that fractures of the lower jaw in dogs might well be left alone, but he agreed with Major Wright that, in cases of displacement, they should be fixed.

With regard to Mr. Masson's query concerning spinal anæsthesia, he thought the length of the animal's back had some bearing on dosage, but with Parcaine injections up to from 12 to 18 c.cs the animals remained standing. For operations on the feet he used 20 c.cs and over, and the animals then went down. He had not seen permanent paralysis following the use of this method.

He agreed with Mr. R. H. Smythe that insulating tape was useful where an ordinary bandage could not be applied, such as on dogs' tails. Prolapse of the uterus in sows was often fatal, but he had known of recoveries where nothing had been done, the sows eating the organ off.

In reply to Mr. Thwaite, Mr. Bowett said that he injected two ounces of Calcium Sandoz as a first treatment for milk fever, and in cases which relapsed he employed a second dose of one ounce. For the treatment of "wens" he thought the use of sulphuric acid was barbaric, although he knew this was often a successful line of treatment.

Eleventh International Veterinary Congress, London, August, 1930.

Abridged Papers.

(*Continued from page* 1149.)

Tuberculosis Inoculation.

By Alberto Ascoli.
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The Innocuity of the Calmette-Guérin Vaccine.

Earlier methods of protective inoculation against tuberculosis involved the use of tubercle bacilli of the human type, which is not pathogenic for bovines. In view of the fact that B.C.G. vaccine is an attenuated bovine strain, proof must be furnished that it is quite incapable of producing tuberculosis.

It may be maintained that subcutaneous inoculation against bovine tuberculosis with B.C.G. vaccine has never been the starting point of a tuberculous infection. The results obtained in thousands of calves vaccinated have not been shaken by experiments with rabbits and guinea-pigs.

Care must be exercised to distinguish between the capacity to produce tubercles and the capacity to produce tuberculosis. It is confusion between these two that has caused much difficulty. The presence of tubercles in the lungs of guinea-pigs and rabbits inoculated intravenously with B.C.G. has been held to be proof of the capability of the vaccine to produce tuberculosis. It is imperative, however, to determine whether the bacilli present in such lesions are virulent for calves. The author has never found exaltation of virulence of the B.C.G. vaccine for calves.

He describes some of his experiments regarding the attenuation of the bovine type of bacillus resulting from repeated subcultivation on potato treated with bile and glycerin.

The strain of bacilli used was isolated from a bronchial gland and was of such virulence that intravenous injection of 0·001 gramme of culture into a calf produced acute tuberculosis in a month.

A chart shows the progressive loss of virulence after a series of subcultivations. After 40 passages intramuscular injection of 0·025 mg. of culture into the thigh of guinea-pigs produced tuberculosis of the inguinal glands only. This result was achieved in the course of four years. The

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With regard to Mr. A. R. Smythe's remarks, he agreed that the reflexes were not always quite removed by Avertin anæsthesia in the dog, but it was usually very good in cats. Mr. Smythe had said he thought hygroma of the knee in cattle was best left alone, but the point was that the owner might want it removed.

He asked Mr. Smythe how often he blistered cases of "claw-ill," and the reply was that a mixed blister could be applied once a week.

In connection with Mr. Harvey's remarks about the toxic effect of mercury, he had known of 13 times the ordinary dose being given in error, as one dose, without a fatal result.

B.C.G. strain has been under cultivation for 13 years and has passed through 230 generations. Intramuscular inoculation of guinea-pigs with this strain is harmless.

The Criterion of the Value of the Inoculation for the Control of Tuberculosis.

In the first place it must be ascertained what degree of protection is furnished by the vaccination against experimental inoculation. The findings of Calmette and Guérin, Mello, and Ascoli agree that vaccinated calves possess a higher degree of resistance to experimental inoculation than unvaccinated calves.

Exposure of vaccinated and unvaccinated calves to natural infection in cowsheds has furnished evidence that vaccination increases the capacity to resist infection to a remarkable degree. The discovery of a mixed infection of tuberculosis and actinomycosis in one case leads the author to think that such mixed infections may be responsible in some cases for the failure of the vaccination.

The value of the vaccine when administered *per os*, as it is in the case of children, has also been tested with calves. Two calves were given 0·3 g. and 0·6 g. of B.C.G. in milk shortly after birth, and a month later they were placed in close contact with a tuberculous cow, with tubercle bacilli in the sputum, for a year. On slaughter the calf which had been given the smaller dose was found to have localised tuberculosis in the pharyngeal and mesenteric glands, while the other was perfectly free from tuberculosis. There is thus evidence that, provided the dose of vaccine given be sufficiently large, protection can be conferred by way of the alimentary canal.

Results of Protective Inoculation in Practice.

The value of the method in practice is not to be established by experimental methods. While the majority of experiments are favourable to the method, it cannot be denied that accidents have occurred with the subcutaneous injection of the B.C.G. vaccine. It will be possible to form a reliable judgment only when the method has been in use sufficiently long for vaccinated animals to have calved several times.

Experiments have now been in progress in Italy for five years, and Seiferle has expressed the view that "The campaign against bovine tuberculosis stands or falls with the co-operation or the passive resistance of the agriculturalist."

Anachoresis.

The author found, in the course of his work, that the inoculation produced an aspecific protection against "breeding diseases" of calves, and this created a favourable impression among agriculturalists.

It had been urged against the Behring method of vaccination that it favoured outbreaks of calf pneumonia and septicæmia.

It is the experience of Ascoli and his school that the subcutaneous injection of the Calmette vaccine acts as a check on these diseases.

Reports confirming the production of a high degree of resistance against calf pneumonia and calf septicæmia by the subcutaneous injection of B.C.G. have been received from several quarters. The injection would appear to act as a "fixation abscess." The author proposes the term "anachoresis" for this phenomenon.

The Evaluation of the Specified Protection.

This can be determined by comparing the extent to which tuberculosis occurs in unvaccinated and vaccinated herds.

A chart based on Seiferle's figures shows that there is a rapid rise in the incidence of tuberculosis in cows from the fourth to seventh year and over. In cows up to four years the percentage is given as four per cent.; between four and seven years, 26 per cent., and cows over seven years 63 per cent.

A chart shows the percentages infected in vaccinated animals, but this does not go beyond animals between four and five years, the figure for which is given at three per cent. Figures of sufficient magnitude to warrant a definite opinion are not yet available.

The chart for the vaccinated animals is based upon the following figures:—

Among	3,819	animals vaccinated	once	7	cases were found.
,,	1,579	,,	twice	6	,, ,,
,,	714	,,	three times	1	case was found.
,,	199	,,	four times	1	,, ,,
,,	32	,,	five times	1	,, ,,

Eleven of the cases were carefully investigated, and in ten of these there was a mixed infection of actinomycosis and tuberculosis. In six cases there was severe generalised tuberculosis, and in the remaining five it was slight and limted to the lymphatic glands.

A. L. S.

A Comparative Study of Vaccination with Living Tubercle Bacilli and with Special Reference to B.C.G.*

By E. A. Watson,
Chief Pathologist, Animal Diseases Research Institute, Department of Agriculture, Hull, Quebec, Canada.
(E. A. Watson, C. W. McIntosh and H. Konst.)

For half a century, scientific endeavour has been directed towards the problem of tuberculosis as a preventible disease, and at no time more intently than at the present day. Through continuous experimental research, success, failure and bitter experience, newer knowledge is handed down; but tuberculosis infection and prevention still remains as one of the most difficult, intricate and involved problems within the scope of human and animal preventive medicine. Koch wrote, in 1882 "We must devote ourselves, before anything else, to drying up the sources of infection." This has been the guiding principle in preventive efforts. Calmette[1] reiterates it in the concluding chapter of his monumental work, "Tubercle Bacillus Infection and Tuberculosis in Man and Animals"; "The essential aim," he writes, "which we ought and wish to pursue is to *dry up the sources of infection or to render them harmless . . . . Before all then and above all, our efforts at combating tuberculosis should be concentrated against introductions of infection . . .*"

It is a safe assumption that few, if any, will question the truth and wisdom of these principles; it is only when it comes to their practical application, by direct or indirect methods, drastic or palliative, that the question becomes

* From the Animal Diseases Research Institute, Dominion Department of Agriculture—Co-operating with the National Research Council—Ottawa, Canada.

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highly contentious or controversial. This is not surprising in view of the multiform nature of tuberculous infection in which, as expressed by Theobald Smith, " There are two variable, adaptable organisms; the animal body and the tubercle bacillus, each of which may act within an entire gamut of states, thus yielding a large number of possible results."

Many important deficiencies in bacteriological and immunological knowledge of this infection have yet to be filled and finality in the development and expression of ideas concerning the biological characteristics and pathogenic attributes of the tubercle bacillus seems far distant.

Meanwhile, attack and pursuit is made in different ways and along different lines. What is possible, applicable and seems best in one country may be impossible, inappropriate or unwarranted in another, according to special conditions economic factors, etc., peculiar to each.

In Canada, Dr. George Hilton, Veterinary Director-General, and in the United States of America, Dr. John R. Mohler, Chief of the Bureau of Animal Industry, are leading the most comprehensive campaigns ever organised for the eradication of bovine tuberculosis, systematically destroying the principal sources of infection, building up clean herds and establishing immense areas free from tuberculosis. Thus, in North America, direct and very drastic methods of elimination are employed. In Europe, the tendency seems to be towards the indirect methods of prevention by separation, segregation, etc., and more recently by vaccination as reintroduced by Professors Calmette and Guérin[2].

The publication (1924) by these distinguished workers of the Pasteur Institute of their important paper on B.C.G. vaccination and a new method of prophylaxis aroused the greatest interest and, indeed, enthusiasm. In some quarters there was an evident tendency to accept assumptions and hypotheses as proven facts and to proclaim the problem of tuberculosis as solved. Others, remembering the disappointed hopes and illusions of previous attempts at vaccination, proceeded more cautiously.

The Dominion Department of Agriculture immediately decided to investigate thoroughly the claims made. The moment was opportune since the investigation could be carried on simultaneously with tuberculosis researches then in progress, and in particular those relating to the natural, variable susceptibility and resistance of cattle under different conditions of exposure to infection and reinfection, and to the action of certain serums and vaccines developed in the Department's research laboratories. This " B.C.G. " investigation was started in 1924 and, since 1925, has formed part of co-operative studies carried on jointly by the National Research Council[11], the Dominion Department of Agriculture and other Canadian Institutions. The report that follows covers more than five years of experiment and trial but does not include several large groups of cattle vaccinated since 1928 and which will not be killed and reported upon until a later date.

Experiments on Cattle.

Only Government-owned cattle have been used, consisting in part of a tuberculosis herd acquired from one of the Government Experimental Farms and in part of purchased healthy cattle from accredited tuberculosis-free herds. The calves were segregated at birth, fed either pasteurised milk or milk from tuberculin-tested, non-reacting cows, and vaccinated within the first week of life.

The experiments deal with :—

(1) Cattle vaccinated with B.C.G.

(2) Cattle vaccinated with moderately virulent tubercle bacilli.

(3) Unvaccinated control cattle

subjected to immunity tests or trials by :—

(*a*) Experimental inoculation of measured doses of virulent tubercle bacilli.

(*b*) Ingestion of virulent bacilli.

(*c*) Natural exposure to tuberculous infection under farm conditions.

Conditions of Exposure to Natural Infection.

To make a fair trial of B.C.G. vaccination, of its efficacy and value, the conditions commonly found on farms and in dairy herds in respect to methods of feeding, pasturing, the sources and hazards of natural infection, have been more or less duplicated. The cattle have been housed in modern, well ventilated stables of steel and concrete construction, far superior to the average farm type of building. From spring until late autumn the cattle are kept in small pastures, where in addition to the natural grass, they are fed from large field racks or mangers, a common custom on the ordinary farm and one which lends itself to the dissemination of infection. The milk fed to the calves was partly from tuberculin-reacting cattle and partly from healthy non-reacting cattle. Subsequent exposure to infection was through cohabitation with tuberculin-reacting cattle, usually one of the latter to four or five of the vaccinated and unvaccinated controls. Naturally, the conditions have varied during these five years of experiment and trial just as they must necessarily vary upon a farm or in a herd where disposals and replacements are made from time to time.

Severity of exposure and the hazards of infection and reinfection are not governed by the number of tuberculin-reacting cattle in a herd so much as by the presence or absence of one or two active cases of tuberculosis eliminating large numbers of highly virulent bacilli.

It is a common experience in taking out of a herd the positive tuberculin reacting animals to find at autopsy not a single active open case but evidence only of slight infection or of a few seemingly arrested lesions. Such factors which cannot be foreseen or controlled are the probable explanation of the varying or apparently contradictory results following B.C.G. vaccination of cattle.

That the conditions of exposure have not been unduly severe is indicated by the results of periodic tuberculin tests. A number of the unvaccinated control calves were non-sensitive to tuberculin until the third or fourth test, after 9-12 months of continuous exposure. In the experimental trials, 1925-27, the original procedure recommended by Calmette and Guérin was followed and not the modification requiring a period of isolation, etc., as introduced in 1927. Nevertheless, from the fact that tuberculin sensitivity was not manifested by the majority of the unvaccinated control calves until after an interval 3 to 12 times longer than that of the specific period of isolation, we believed that a reasonable interval, *at least one month,* elapsed between vaccination and subsequent infection and that in the majority of the animals the purpose of isolation, *i.e.,* time and opportunity for immunity to establish itself before virulent infection took place, was unconsciously achieved.

In some experiments, the calves were guarded against

possible infection from birth until a lapse of three to six weeks after vaccination.

Neither by intravenous inoculation nor by ingestion has the "*Vallée*" strain shown the *high* degree of virulence for young cattle, as reported by a number of European investigators. Possibly, it has lost some of its former virulence in the authors' hands. It appears less virulent than the other tuberculosis bacilli strains used in these trials.

Guinea-pig test inoculations of the glandular lesions were positive for all 12 cattle, of the normal lymph glands positive for two and negative for ten, and for the B.C.G. vaccinal nodes were negative for the four cattle from which material was collected.

The re-vaccinated animals did not exhibit any more resistance than those vaccinated but once. Acid-fast bacilli were found in material collected from the B.C.G. vaccinal nodes of five of these cattle at the time of slaughter, but guinea-pig inoculation-tests for virulence were positive for only one of the five and had negative results for the other four.

Guinea-pig inoculation-tests for virulence of material taken from the B.C.G. vaccinal nodes of the three cattle at the time of slaughter proved positive for one and negative for the other two.

The duration of the vaccination and immunity trials has varied, as shown, within a range of two months to 4½ years. The great majority of the animals gave autopsy evidence of tuberculous lesions.

The Virulence of B.C.G.

Calmette's claim, oft repeated, that B.C.G. is "*absolutely avirulent*" or "*absolutely innocuous*" and "*incapable of producing tuberculous lesions in any species of susceptible animals*" has been investigated by many workers and is still the subject of much controversy and difference of opinion. There are many who profess to have validated Calmette's claim, and others who have refuted it; and in between, there may be found all shades and stages of disagreement from very slight and benign to extensive (like tuberculous lesions themselves!).

As among the first to question both the "absolute avirulence" and "immunizing efficiency" of B.C.G., the authors have incurred some harsh and hasty criticism. Certain writers have astonished them by the manner in which they have misrepresented, misquoted and misinterpreted their experimental evidence and conclusions. For example, in the "Critical Study of the Literature on B.C.G.: Report of the Technical Conference for the Study of Vaccination against Tuberculosis by Means of B.C.G.[7]" (League of Nations, III, Health, 1928, III, 17), page 90, experiments with vaccinated calves, relating solely to to immunity trials under conditions of cohabitation with tuberculous animals and exposure to natural infection, are quoted and discussed under "Studies on the Innocuousness of B.C.G."—"Virulence of B.C.G. for Bovines," *with which they are in no manner concerned*, and are made to appear contradictory to or at variance with the observations and experiences of all other investigators in regard to B.C.G. innocuity for cattle. Other similar examples could be given, but there is no need to refer to them. The authors wish only to take this opportunity of correcting misleading impressions by a short and clear statement of their experiments and conclusions based thereon.

In the first place, they have never claimed or stated that B.C.G. was virulent for *bovines*. Very frankly, they say they do not know. They suspect that it might be, under certain conditions, through a restoration or awakening of latent properties, but they have as yet no definite or wholly satisfactory evidence to confirm such suspicions in regard to *virulence for cattle*. They have claimed, however, and do claim, that B.C.G. has not entirely lost its virulence for laboratory animals.

In a previous publication[19] (1928) they have dealt at length with the question of virulence and given the evidence from 134 pathogenicity tests, on guinea-pigs, of 15 serial preparations of B.C.G. Slight or more or less localised lesions were found in 22 per cent., and typical extensive lesions of tuberculosis in 9 per cent. of the guinea-pigs inoculated. Lesions from selected cases were successfully reinoculable in four out of five series of passage experiments. Several hundred additional tests made in the last two years with B.C.G. grown upon media such as glycerinated potato, without bile, have given a low percentage of positive results, lower even than in the previous 134 tests.

More positive results have been obtained with B.C.G. Strain 80 (1924) than with Strain 17 (1925); while only one positive result has so far been obtained with Strain 346 (1927). It appears possible that during the past five years, or as time goes on, B.C.G. propagated continuously on laboratory media, especially bile media, has become further attenuated.

A complete report of all experimental evidence of the virulence of B.C.G. for laboratory animals will be published elsewhere. Time and space does not permit here, say the authors, of more than a statement of conclusions:—

First: B.C.G., under laboratory conditions of cultivation and study, is not devoid of pathogenic attributes.

Second: B.C.G. is apt to provoke, in guinea-pigs, specific tuberculous lesions which, in the majority of cases, show a tendency to localisation and healing.

Third: Lesions caused by B.C.G. are not always of a benign character.

Fourth: Exceptionally, in a small minority of cases, B.C.G. may produce in guinea-pigs a slowly progressive tuberculosis.

Fifth: B.C.G. lesions, particularly the progressive type of lesions developing after a long period of latency, are reinoculable and transferable from guinea-pig to guinea-pig in serial passages.

Sixth: Under experimental conditions, by serial passage in the manner indicated, it is possible to raise the virulence of B.C.G. to that of unattenuated bovine tubercle bacilli.

Seventh: Virulence is a latent or potential property of B.C.G. which may or may not manifest itself. Its activity may depend upon some unusual stimulus, an abnormal condition which lowers resistance or creates a favourable environment for the development of infection, and the prolonged action of time; also, upon the culture media and the conditions under which it is propagated in the laboratory.

Eighth: The virulence of B.C.G., as a rule of very low degree, is not rigidly and permanently fixed; and B.C.G. remains relatively but not "absolutely" avirulent and innocuous.

UMI

Discussions, Summary and Conclusions.

In interpreting the evidence and results of trials of vaccination and immunity against tuberculosis, a disease so commonly characterised by insidious, intermittent, arrested, latent or occult infection, the time factor is obviously of very great importance and must be taken into consideration for each individual and group of animal experiments.

Of no less importance are the variable factors in the conditions under which, over a period of several years, such trials and experiments are made; particularly, the unequal hazards, degree and frequency of infection and re-infection under natural conditions of exposure, the stress and strain of milk production and the bearing of offspring, and the variable natural susceptibility and resistance of individual animals.

A tendency to disregard one or more of these factors is evident in much of the published literature on the question of B.C.G. vaccination, in which the relative disproportion of direct or convincing experimental evidence to favourable results and far-reaching conclusions, and a readiness to accept assumptions and unproved claims as evident truths have been remarked upon by several writers.

Since 1924, more than 200 cattle have been maintained at the Animal Diseases Research Institute, Dominion Department of Agriculture, for experiments relating to the study of vaccination against tuberculosis. This number includes calves which died within the first month of life from causes other than tuberculosis and were therefore eliminated from the experiments. The majority of the calves vaccinated in 1928 and 1929, together with an equal number of unvaccinated controls, are still living and do not figure in this report.

Immunity trials have been concluded for 48 vaccinated and 24 unvaccinated control cattle. The duration of these trials has varied between 2 months and 4½ years. 78·4 per cent. of cattle vaccinated with B.C.G., 90·0 per cent. of cattle vaccinated with virulent bacilli, and 75·0 per cent. of unvaccinated control cattle, exhibited evident tuberculous lesions at the autopsies.

The autopsies were conducted under laboratory conditions with scrupulous care. Had they been made under ordinary abattoir conditions it is possible that several animals would have passed veterinary inspection as free from tuberculosis and the percentages of animals infected would have been correspondingly less.

The widest variety in number, extent, location, character and stage of development was common to each group of cattle, vaccinated and unvaccinated. In some animals evident lesions were found in only one lymph gland, in a few the condition was typical of generalised tuberculosis, and between these extremes all stages of active and apparently inactive infection were encountered.

In trials of this kind upon a limited number of animals and for variable duration periods, in which natural susceptibility and resistance and the hazards of natural infection and reinfections vary from time to time in degree and frequency, percentage differences between 75 and 100 have little real significance. However, the percentages furnished by the results of these trials make it quite clear that there is no great difference between the vaccinated and the unvaccinated. In trials of short duration it would appear that B.C.G. vaccination may exert a retarding action in the development and extent of infection. This, however, diminishes as time goes on or as reinfections and superinfections occur; and in the longer trials the total involvement and the extent of lesions was no less in the vaccinated than in the unvaccinated. On the whole, regarded either from the viewpoint of the percentage of animals infected or from the character and extent of the tuberculous lesions in evidence, the vaccinated cattle had no advantage over the unvaccinated, and B.C.G. vaccination failed to confer any appreciable immunity or protection.

When the more extensive trials in progress since 1928 come to an end, it may be possible to show better results, especially as two contact animals which developed open tuberculosis have been destroyed and eliminated as the more dangerous sources of infection.

Rankin[13], reporting on experiments made at the University of Alberta, Canada, states in his Summary of results, that the percentage of protection varied from 22 per cent. to 100 per cent., and that the average percentage in four experiments: in some Groups *"under immediate contact conditions"* and other Groups *"under delayed contact conditions"*—in all 66 *vaccinated animals,* over periods varying from 4 to 11 months—is 66 per cent., and for the 43 unvaccinated controls in the same experiments only 10 per cent. (Rankin's corrected figures).

According to the present reviewer's analysis of the protocols and reported results, the percentages should read 72 and 16 per cent. instead of 66 and 10 per cent. In either case, the percentage difference or efficiency is 56 per cent. in favour of the vaccinated. The percentage efficiency for the "immediate contact" of some groups is 60 (60 per cent. for the vaccinated and 0 per cent. for the controls); and for the "delayed contact" other groups, 58·6 (the difference between 80·5 per cent. for the vaccinated and 21·9 per cent. for the controls). Actually, therefore, the relative percentage efficiency, as between vaccinated and controls, was not increased by "delayed contact" or the isolation and safeguarding from infection for a period of 2 to 3½ months following vaccination, *which favoured equally the vaccinated and the unvaccinated controls*—a point of importance not mentioned by Rankin in his paper.

His conclusion, "Vaccination with B.C.G. produces resistance in bovines to tuberculous infection," is moderate and in accord with the resulting difference of 50 to 60 per cent. in favour of the vaccinated cattle under immunity trials of very short duration, usually seven to nine months—much too short to afford any evidence of a lasting or efficient protection.

Haring, Traum, Hayes and Henry[9] have very recently (March, 1930) reported *in extenso* the experiments undertaken at the California Agricultural Experiment Station.

The great majority of cattle in both the vaccinated and nonvaccinated groups exhibited tuberculous lesions, the relative extent to which is shown as:—

Type of lesions	Vaccinated	Controls
Extensive	7 ...	40
Well marked ...	13 ...	16
Slight...	27 ...	3
None visible ...	13 ...	1
	—	—
Total	60	60
	—	—

These authors conclude that " the subcutaneous vaccination of cattle with 100 mg. doses of B.C.G. conferred sufficient resistance to protect against *fatal* effects of intravenous or subcutaneous injections of virulent tubercle bacilli. In feeding trials with virulent bacilli, the vaccinated cattle showed less extensive lesions, as a rule, than the unvaccinated." . . . . " The resistance afforded by the vaccine was not sufficient always to prevent the penetration of the walls of the alimentary tract by virulent tubercle bacilli. In most cases this induced a caseation of the cervical and mesenteric lymph nodes. The chief protective effect of B.C.G. seems to be in retarding the extension of tuberculous processes occurring from infection received subsequent to vaccination."

Here, again, the actual trial period or interval between first infection and autopsy is short; in most cases only a few months and in a few up to 13 months.

Larson and Evans[10] working in Illinois and Schroeder and Crawford[15] at the Experiment Station of the U.S. Bureau of Animal Industry, have reported unfavourable results from a very limited number of completed experiments.

The former report four of seven calves vaccinated with B.C.G., two of eight calves vaccinated with killed bacilli, and two of six untreated controls, with tuberculous lesions at autopsy, or a greater incidence of tuberculosis in the B.C.G. vaccinated calves than in the other groups.

Schroeder and Crawford[15] report nine of eleven cattle vaccinated with B.C.G. and nine of ten controls, with tuberculous lesions, and conclude with: " In the group where exposure was made by feeding virulent tubercle bacilli, the vaccinated cattle showed more extensive lesions, as a whole, than the unvaccinated. In the three other groups, resistance to the localisation and generalisation of tuberculosis was slightly more manifest in the vaccinated than in the unvaccinated animals, but in no group was there manifest an immunity as measured by the prevention of infection."

Compilation of Summarised Results Reported by Investigators in Canada and the United States.

Investigators	BCG Vaccination		Unvaccinated controls	
	Cattle	Tuberculous lesions	Cattle	Tuberculous lesions
Rankin...	66	22 (33%)	43	37 (86%)
Larson and Evans ...	7	4 (57%)	6	2 (33%)
Schroeder and Crawford	11	9 (82%)	10	9 (90%)
Haring, Traum, Hayes and Henry ...	60	47 (78%)	60	59 (98%)
Watson, McIntosh and Konst	37	29 (78%)	24	18 (75%)
	181	111 (61%)	143	125 (87%)

The incidence of tuberculous processes, regardless of their relative extent, in B.C.G. vaccinated cattle under immunity trials, as reported by investigators in Canada and in the United States, is shown in the preceding table.

Thus, in the five independent investigations made in North America, we find, *in the aggregate of results*: Approximately 61 per cent. (111 of 181) of cattle vaccinated with B.C.G., and 87 per cent. (125 of 143) of the unvaccinated controls, with autopsy evidence of tuberculosis. Considering the short duration of these immunity trials, less than one year in the majority of the animals, and the evidence from different groups of experiments that as time goes on tuberculous lesions are more frequently manifested, it can hardly be doubted that if the animals had been allowed to live out their existence or to reach sexual maturity, the results would have proved even more unfavourable. Calmette and Guérin[6], on the contrary, contend that if the animals had not been slaughtered at an early age, one to two years, the lesions in the vaccinated animals would have healed by calcification or by sclerosis without ever bringing about pathological symptoms. This assumption is proved erroneous by the evidence produced in many experiments and a comparison of the extent of lesions in cattle slaughtered during the first, second and third years of their vaccinated lives. Some of Rankin's experimental results are quoted by Calmette and Guérin as confirmation of the latter's claims and conclusions. It is true that the former, in the aggregate, show a more favourable percentage than those of other investigators in Canada and in the United States. However, the results from one group, in which four of 16 (25 per cent), and those of another group, in which seven of nine (77 per cent.), vaccinated animals showed evidence of tuberculosis after trials averaging seven months' duration in the former and 13 months in the latter, suggest that tuberculous lesions are more likely to develop and extend than to heal and disappear in the course of time. Rankin's own conclusions, it may be noted, are cautious, and stop far short of those of Calmette.

Apart from the question of " premunising " efficacy and the possibilities of increasing resistance, however, transient, there are possible dangers in the application of B.C.G. vaccination of which it is prudent to take cognizance. Does vaccination tend to create " carriers " of virulent tubercle bacilli and thereby add to the sources of infection? It is not disputed that vaccinated cattle, living in contact with or exposed to tuberculous infection, are frequently, if not habitually, carriers of virulent bacilli.

The reporters' own tests show that virulent bacilli were present in the lesion-free lymph glands of 25 per cent. of B.C.G. vaccinated cattle and in 8 per cent. of the controls.

Calmette[6] and Guérin[8] contend that this virulent bacillary infection is a " simple parasitism," nontuberculigenic for the premunised animal, harmless and even beneficial, similar in its effects to the non-virulent bacillary infection with B.C.G., and that " Koch's bacillus, which is virulent in the vaccinated animal, does not circulate through the lymphatic system." It is difficult to reconcile this view with the evidence of tuberculous lesions in one or more groups of lymphatic glands and the presence of virulent bacilli in other groups of lesion-free glands in the same vaccinated animal.

Rankin[14] has reported upon milk tests conducted by his associate McCullogh, of B.C.G. vaccinated cattle which have borne offspring, stating that three of these young cows, vaccinated as calves in 1925, are excreting at different times virulent tubercle bacilli in their milk, as proved by guinea-pig inoculation tests.

In enunciating the " scientific principles which should serve as a basis for prophylaxis against tuberculosis," Calmette[1] says " The essential factors of contamination are the disseminators of virulent germs . . . They include

the occult or latent tuberculous, who, well themselves . . . . *eliminate bacilli intermittently with their glandular secretions or with their dejections.*" "We know now," Calmette goes on to say, "that subjects who react positively to tuberculin, although perfectly healthy in appearance, eliminate virulent tubercle bacilli from *time to time* and disseminate them in their secretions. *These sources* of virus, manifest only at intervals, are all the more dangerous in that they are almost always unsuspected. They spread bovine tuberculosis in stable and pig-sty."

That is precisely the present authors' viewpoint. How, then, they say, can one look with favour upon "premunised" animals continuing their existence as carriers of virulent tubercle bacilli and as excretors and disseminators of the same through the milk route and in other ways? The advocacy of a method of vaccination which permits and induces such conditions would appear unsound from a public health viewpoint and incompatible with the principles of "drying up the sources of infection"—human or bovine.

In tuberculosis immunity trials following vaccination with living tubercle bacilli, under different conditions and for variable durations and even under conditions which, in so far as it is practical to arrange and control them, are similar, but never constant, results vary within wide limits. Some of the reporters' vaccinated cattle at the end of two year trials have furnished unquestionable evidence of progressive tuberculosis. "Premunition," which may enable an animal to tolerate a virulent infection for a time, may diminish and disappear, especially when other factors come into play, and there seems to be no valid reason why in such circumstances or conditions, "simple parasitism" with Koch's bacillus should not change and develop into a progressive tuberculosis.

In conclusion, and as a result of a comparative study of B.C.G. vaccination over a period of five to six years, the authors are unable to substantiate the claims made for it as an efficient means of protection against bovine tuberculosis. It is their opinion that with the experimental results thus far obtained and with the knowledge at present available, the use of B.C.G. is contra-indicated in the control of bovine tuberculosis in Canada, where the incidence of the disease and prevailing conditions are favourable to the success of the methods of eradication now employed. They believe that a similar viewpoint is held by their colleagues in the United States in respect to tuberculosis prevention in that country. In Europe, B.C.G. vaccination must be left to the judgment and discretion of those who are in a position to advise and to pass on the possible advantages and disadvantages of its application under the conditions existing there.

Acknowledgments.

To the Veterinary Director-General for his continuous interest, support, and advisory assistance, to the Department of Agriculture for the excellent facilities provided at the Animal Diseases Research Institute; to the National Research Council for their co-operation through the Associate Committee on Tuberculosis Research; and to all members of the Institute staff who have contributed in various ways.

Summary.

The report gives the main features, experimental evidence, and results of investigations relating to "B.C.G." undertaken by the Dominion Department of Agriculture, Health of Animals Branch, at the Animal Diseases Research Institute, Ottawa, Canada.

The questions chiefly concerned are those of "virulence" and "immunising efficacy"; and in this connection three original strains of B.C.G. are under propagation and study. For comparative study, a strain of bovine tubercle bacilli, of ordinary or average virulence, is used in certain vaccination trials running parallel with those of B.C.G.

The experiments with cattle were started in January, 1925, and have continued to date. Vaccinal immunity or "premunisation," was tested by (1) inoculation of measured doses of virulent bacilli and (2) natural exposure to tuberculous infection under farm conditions. In the trials by natural exposure, 1925-27, the calves were vaccinated and treated in accordance with the Calmette-Guérin procedure as originally recommended; and in subsequent trials under the new conditions of isolation, etc., as advised in 1927.

The trials varied in duration from a few months up to 4½ years. Laboratory autopsies on 72 cattle revealed *evidence of tuberculous lesions* in 78·4 per cent. of cattle vaccinated with B.C.G., 90·0 per cent. of cattle vaccinated with virulent bovine tubercle bacilli, and in 75·0 per cent. of the unvaccinated controls.

While slight percentage difficulties, in trials of varying duration and with a limited number of animals, have little significance, it is fairly evident that there are no striking differences between the cattle vaccinated with B.C.G., those vaccinated with virulent bacilli, and the unvaccinated controls, in respect to autopsy evidence of tuberculous lesions. With regard to the relative extent of lesions, there is some evidence that in trials of short duration B.C.G. vaccination may retard the development of infection. This, however, seems more or less transient and in spite of revaccinations diminishes with time and as the cattle continue under exposure to natural reinfection.

Virulent bacillary infection of lesion-free lymphatic glands and of vaccinal nodes taken at the end of immunity trials is shown and attention drawn to the possible dangers arising therefrom.

B.C.G. possesses a latent virulence for guinea-pigs manifest, as a rule, in only a small percentage of test animals and after a very long period of incubation or tolerance.

The several independent investigations of B.C.G. vaccination of cattle reported from Canada and the United States are referred to and followed by a compilation of the *aggregate results* which indicates 61 per cent. (111 of 181) of cattle vaccinated with B.C.G., and 87 per cent. (125 of 143) of unvaccinated control cattle, with autopsy evidence of tuberculous lesions.

A comparative study over a period of five to six years does not substantiate the claims made for B.C.G. vaccination as an efficient means of protection against bovine tuberculosis. The opinion is given that with the results thus far obtained and the knowledge available, the use of B.C.G. is contra-indicated in the control of bovine tuberculosis in Canada, where the incidence of the disease and the conditions that prevail are favourable to the success of drastic methods aiming at the destruction of the sources of infection.

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Vaccination Against Tuberculosis.

By Dr. W. V. Guérin.
Chef de Service à l'Institut Pasteur, Paris.

It is a mistake to think that active vaccination against tuberculosis is sufficient of itself to ensure protection against the disease. Investigation has clearly shown that the pathogenesis of tuberculosis is such as to make it essential to impose initial sanitary precautions both in bovines and in the human subject.

In view of the fact that it is only the presence of living tubercle bacilli in the body which produces the resistance, and that it is the first organism to gain access which leaves its mark, it is essential that the first invader is a harmless but efficacious bacillus of the B.C.G. type.

The prevention of tuberculosis in bovines, therefore, comprises in the first place rigid isolation immediately after birth and feeding with milk free from bacilli, and in the second place, proper vaccination with B.C.G., which results in the producion of specific resistance against natural infection.

The absence of phagocytic action makes the tubercle bacillus a veritable foreign body which the animal body can eliminate by its natural excretory functions only.

In an animal in an allergic state resulting from vaccination with B.C.G., and subjected to superinfections with tuberculosis, there should be, at the most, a balance between the number of infecting bacilli and the number which the body is capable of eliminating normally. If the number of bacilli absorbed is larger there will be an accumulation of virulent organisms in the lymphatic system, and actual tuberculous lesions may be produced, but these will not be extensive as a rule.

The Veterinary Committee on B.C.G., which was instituted by the League of Nations in October, 1928, drew up protocols of attempts to vaccinate bovines against tuberculosis, and decided that these attempts ought to be carried out on infected farms, that vaccinated and control animals should continue to live the ordinary routine farm life and should not be subjected to any artificial contagion (Ascoli, Berger, Frenkel, Gerlach, Nowak, Vallée, and Zeller).

Vaccination with B.C.G. is more simple than intravenous injection; the dose is injected subcutaneously, and only one intervention is required.

In opposition to the opinion of 50 investigators who, as a result of experiments carried out on rodents, have formed the opinion that the strain is innocuous, a few investigators maintain that B.C.G. is capable of producing progressive tuberculous lesions which are reinoculable (Nobel, Petroff, Watson). The experiments of these authors do not resist objective criticism as regards the harmlessness of the vaccine for laboratory animals.

It is not denied that it is harmless for bovines, and this is in agreement with the conclusions drawn by the Committee of Experts: "From the experimental facts collected, and from the unanimous opinion of practitioners who have used B.C.G. for bovines, it is clear that vaccination by the method of Calmette and Guérin is absolutely harmless for bovines."

The reports published during the last three years by laboratory workers and practitioners can be grouped according to whether the initial hygienic measures, which are indispensable, were observed or not, and also by the manner in which the infection tests were carried out (whether deliberate infection or natural contagion).

Ignorance of protective measures for small animals and unreasonable methods of testing lead to the production of bad results. The more closely investigators adhere to the conditions which we know to be essential the more favourable to the efficacy of the vaccine the results become.

The Regulations laid down by the B.C.G. Commission about two years ago for free treatment of bovine tuberculosis adapted to the immediate interests of stock-owners and carried out under the control of the veterinary service, serve as a guide to those veterinary surgeons who really desire to do useful work in combating tuberculosis. They are as follows:—

(*a*) This method of protection can be applied on all farms infected with tuberculosis where it is the custom to raise young animals to replace the old ones.

(*b*) These farms must be provided with a small isolation stable, carefully disinfected and kept in proper condition constantly, in which calves are to be put immediately after birth and prior to dressing the navel.

(*c*) These calves are fed artificially from a bottle only, or on germ-free milk from a pail. The giving of the colostrum is forbidden.

(*d*) Calves, at least heifer calves, which are intended for breeding, are vaccinated subcutaneously with B.C.G. within a fortnight of birth.

(*e*) Vaccination is repeated annually.

(*f*) Since the beneficial action of the inoculation may be considered to have become effective 30 days after vaccination, calves may be admitted to the ordinary farm life from

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H. G.

The Veterinary Record.

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A Merry Christmas to all our Readers.

The Immunisation of Cattle against Tuberculosis.

In this issue of the *Veterinary Record* we continue our policy of publishing abridged papers of proceedings of the 1930 International Veterinary Congress, and we invite our readers to consider very carefully the reports this week on vaccination against tuberculosis. The papers produced at the Congress on this subject were devoted almost exclusively to the procedure introduced by Calmette and Guérin, whose vaccine, which consists of an attenuated bovine strain, is generally known as the B.C.G. vaccine. The wide divergencies of conclusions arrived at by investigators as the result of experimental work with this vaccine rather bewilder the onlooker, be he veterinarian or agriculturist, who is naturally anxious to seize any opportunity which affords hope of effectively controlling or eradicating this devastating disease. It is very remarkable that most of the European workers are strong in support of the B.C.G. vaccine, while the transatlantic workers, notably Watson and his co-workers, have been unable to support the claims made by their European colleagues. It might be noted, however, that it is not claimed that absolute immunity is produced by vaccination with B.C.G. Indeed, Guérin emphasises that " it is a mistake to think that active vaccination against tuberculosis is sufficient of itself to ensure protection against the disease " and that it is essential that all hygienic precautions shall be taken. If this is done he claims a specific resistance, not complete immunity, against *natural* infection. Ascoli claims that " exposure of vaccinated and unvaccinated calves to *natural* infection in cowsheds has furnished evidence that vaccination increases the capacity to resist infection to a remarkable degree." In their argument in support of their conclusions, these workers appear to bring forward an unanswerable case when considered alone, and it must be admitted that certain work on the subject in this country affords them considerable support. But, on the other hand, the details and argument furnished in Watson's report and his conclusions based thereon appear in themselves to be equally unanswerable. What is the poor bewildered clinician to do in these circumstances? One can only advise him for the present to maintain an open mind and await the results of more experimental work and the effect of time and exposure as vaccinated animals get older.

There are two other aspects of the case, however, on which there appears to be more agreement and both of which are of very great concern to the clinician and will need his careful consideration if the procedure of B.C.G. vaccination is widely adopted. One is that the vaccine is an attenuated bovine strain and it is possible, and in many cases probable, that the vaccinated animals will be discharging living tubercle bacilli through one or another channel. One may see great danger in such a case in view of the possibility (though Guérin and others assert the improbability) of such organisms regaining virulence and maintaining infection on a farm. Moreover, one may visualise great objections to such a contingency in any effort to eradicate the disease, though the objections may not be so great in the attempt to control it by reducing susceptibility in heavily infected areas over a period of years as a preliminary to the more drastic measures for its eradication.

The other aspect referred to lies in the fact that vaccinated animals react to tuberculin. The clinician's difficulty is readily appreciated in this connection, for he will be quite unable to establish whether or not the reaction in any particular case is to be regarded as an indication of dangerous infectivity or as evidence of a relative immunity due to vaccination.

It is impossible to dispose of this intensely important subject without some reference to two other methods—claimed to be effective in immunising cattle against tuberculosis, both of which have recently been again emphasised by their originators. We refer to the methods of Spahlinger and of Nathan Raw. We have had

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that time. They should be marked indelibly in some way, or a very exact description should be taken, so that they may be recognised.

(*g*) Conclusions regarding the condition of vaccinated animals, and regarding the state of affairs in the herd after the practice of vaccination has been resorted to, as compared with that existing before, can only be based upon *post-mortem* examinations carried out by a specialist or by a veterinary inspector at the abattoir.

(*h*) The experiment, which is one of the least troublesome, will be pursued as long as necessary for the formation of a reasoned opinion as to the value of the method.

A positive reaction to tuberculin has been considered in bovine practice as evidence of the existence of tuberculosis. We now know that in animals vaccinated with B.C.G. it is evidence of a condition of allergy, that is to say, of resistance to infection. It is towards the generalisation of this allergic condition produced in bovines by B.C.G., or some other method, that a negative reaction, indicating susceptibility, should lead us in the future.

an opportunity of looking through the protocols of Spahlinger's recent tests carried out on calves in Norfolk. The details, as vouched for by a committee of well-known and responsible men, including veterinary surgeons, doctors and experienced agriculturists (though by whom appointed does not transpire) would seem to show that "the Spahlinger vaccine immunises calves against massive injections of a virulent tubercle virus which kills unvaccinated calves in about a month." It is true that this test was conducted on 18 calves only, in addition to four controls, but they would appear to be sufficiently striking to justify an extensive test by some competent and independent body. But so long as Spahlinger persists in his attitude of secrecy regarding the method of preparation of his vaccine, we are afraid that so long will he find it difficult or impossible to persuade any responsible scientific body to work along with him. All that he will state at present is that it is prepared from dead bovine tubercle bacilli. We would ask Dr. Spahlinger to take the world of science into his confidence and to come out into the open if he is anxious to have his methods impartially appraised, and if he is really as anxious to confer such an enormous blessing on animals and man as he claims to be able to do.

The position in regard to the method of Dr. Nathan Raw is somewhat different, and was ventilated at the November meeting of the Comparative Medicine section of the Royal Society of Medicine. Raw makes no secret of his methods or the origin of his culture of tubercle bacilli which, he asserts, have been so long subcultivated as to have lost their virulence and which are also killed in the preparation of the vaccine. Raw claims that thousands of calves have already been vaccinated in England by his method and with satisfactory results, but that no official recognition of the fact is forthcoming. He further stated at that meeting that he is prepared to supply free any reasonable amount of his vaccine to responsible veterinary surgeons willing to put it to the test under normal conditions of practice. Whatever value there may be attributable to the methods of Spahlinger and Raw, since they are both prepared from dead bacilli they must obviously be free from any danger of causing the disease in any of the vaccinated animals or of introducing infection into clean premises, and moreover, they are less likely to interfere with ordinary conditions of practice by interfering with tuberculin reactions.

We are of opnion that sufficient is now known of these various investigations into the possibilities of immunisation against tuberculosis to warrant the setting up of a Royal Commission to explore the whole field of tuberculosis and its prevention. It would take several years and much money to carry out its work and to prove the efficiency or otherwise of various methods, but we believe that in the minds of all responsible people it would be time and money well spent.

Clinical and Case Reports.

Ground Linseed Poisoning.

By W. A. Campbell, M.R.C.V.S., Boroughbridge.

On Sunday morning, November 23rd, I received an urgent call to see three cart horses that had just been discovered ill in their stalls. On arrival, I found a six-year-old mare just dying and the other two very ill. The dying animal was foaming at the mouth, with very laboured breathing, and with patches of sweat over the body. She threw herself down and was dead in a few minutes. The mare in the adjoining stall was blowing heavily and sweating about the mane and flanks; temperature normal and pulse strong but rapid. The third, a hard useful sore of mare, about twenty years of age, was standing very quiet with little to be seen wrong about her, except that she refused all food and her temperature was 98° (subnormal).

I at once suspected poisoning and Mr. Patterson, my assistant, suggested that the symptoms shown pointed to H.C.N. On questioning the owner, I found that the driver of the two younger mares had reported them coughing the night before, and although the animals were working and eating well, they decided to give them a hot linseed mash. All the linseed available was some that had been secured for poulticing purposes some six months before. The owner assured me that it looked fresh and sweet, that the smell was all right, and that he could have got the lot into a pint measure. Also, he is sure that it was boiled for at least twenty minutes.

The treatment consisted of hypodermic injections of ether and digitalis and strychnine; but nothing appeared to have any affect and the second mare, getting gradually worse all the time, died about four o'clock on the Sunday afternoon showing the same symptoms as the first.

The old mare showed very little amiss all Sunday and all day Monday, but refused all food and her bowels never moved. On Tuesday morning she began to get uneasy and started with acute diarrhœa and great pain. Heavy doses of Opii tinct, and injections of morphia had no effect, and she died, showing acute enteritis, about 4 p.m. The attendant tells me that the first mare to die had eaten up all her feed and was dead fifteen hours after getting it. The second mare had left about one-third of her feed and was dead twenty-two hours after. The old mare had only eaten about half her feed, and she was the greediest feeder of all, as a rule; she lived nearly three days.

Post-mortem.—The *post-mortem* on the first two revealed very similar findings. The lungs were black and gorged with blood. The stomach lining and the first few inches of the small intestine were highly inflamed. Apparently the condition of the lungs was the immediate cause of death. In the old mare the lungs were normal, the lining of the stomach red and slightly inflamed, the large colon and small colon highly inflamed in patches.

I consider that the *ante-mortem* and *post-mortem* symptoms shown by the first two mares are typical of prussic acid poisoning, but those shown by the old mare

are new to me, and, had I not had the other two as a guide, I doubt if I would ever have thought of blaming the linseed for her death. The small quantity given, and this being well boiled, makes me think that I have been underestimated the deaths from this cause, continually taking place amongst bucket-fed calves.

Notes on the Treatment of Wounds by Ultra-violet Rays.*

By J. Adamson, Junr., Royal Veterinary College, London.

The value of ultra-violet rays in the treatment of wounds applies especially to those healing by second intention or granulation, and to septic wounds which are grossly infected by micro-organisms. On wounds of this nature the healing process proceeds normally, as in similar ones treated with antiseptics, but much more rapidly.

The bactericidal powers of the rays are good, but they are not penetrating and bacteria must be exposed in thin layers to obtain the maximum effect. To achieve this object the wound should have as much of the tissue detritus as possible cleared away before exposure: "Spores are often twenty times more resistant to certain chemicals than bacteria are, but this is not the case with their resistance to ultra-violet radiation where the figure is only 1·5 to 5 times, The aboitic effect is also independent of temperature. It can take place just as easily in clearly frozen air as it can in water."†. The same authors state that various bacteria do not vary in the time taken to kill them by ultra-violet ray. There is also "an increased bactericidal property of the blood itself, increased lymphocytosis in the part and stimulation of cicatricial tissue."

The rays should be applied in the greatest amount at first, in order to render the wound less septic, and when the new granulation tissue begins to form the period of exposure should be shortened, as over-exposure tends to kill or inhibit the growth of cells by affecting the protoplasm.

Technique.—The lamp used was a suspension quartz mercury vapour type. The wound is cleansed with hydrogen peroxide and all pus and desquamated epithelium are removed. The part may or may not be treated with ether to dry it. The lamp is usually allowed to burn for five minutes before exposing the patient, as it takes about this time for it to reach its maximum intensity. The duration of the exposure must be determined by experience and the effect produced, usually an initial exposure of about ten minutes at two feet is given for wounds. Prolonged exposure tends to cause inflammation in too great a degree.

The following notes relate to two cases treated.

Case 1.—A terrier was suffering from a suppurative condition of the toe nails, whereby they became under-run with pus and sloughed off. The dog received five exposures each of eight minutes' duration at a distance of eighteen inches on alternate days. The rays were directed especially to the feet by placing the dog on his back and holding the feet in a bunch. After nine days the toes had become covered by new horn.

Case II.—A terrier was badly mauled by another dog and had a wound about two and a half inches long above, and on the outside of, the stifle. This was sutured with silkworm gut and the patient taken home to be dressed by the owner. Three days later the dog was off food, the temperature 103·5° F. The wound had a bad smell and the stitches which had not broken out were removed; the wound was cleaned with hydrogen peroxide. An exposure of ten minutes at fifteen inches was given. The next day the wound looked healthier and another exposure, lasting eight minutes, at the same distance was given. The fever subsided and appetite returned. The exposure was reduced gradually to five minutes at twenty inches and at the end of seven days the wound was healed.

* Case presented for award under the N.V.M.A. Clinical Prize Scheme for Students, 1929.

† Russell and Russell, *Ultra-violet Radiation and Actinotherapy.*

Report.

Annual Report of Proceedings under the Diseases of Animals Acts for the Year 1929.

The Report of the Chief Veterinary Officer to the Secretary of the Ministry of Agriculture and Fisheries for the year 1929 has recently been issued, and in view of its importance and interest to the veterinary profession, a digest of its contents is included in this issue of the *Veterinary Record.* The full Report can be obtained, as usual, from H.M. Stationery Office, Adastral House, Kingsway, London W.C.2, or from any of H.M. Stationery Offices in other cities, price 2s. net.

The Report is arranged under the following heads:—

Introduction.

Part I.—Position of Great Britain with regard to animal diseases.

Part II.—Importation, Exportation and transit of animals. Protection of animals and poultry during transit.

Part III.—The Veterinary Laboratory, New Haw, Weybridge, Surrey.

Part IV.—Miscellaneous, including articles on the London Quarantine Station for British pedigree stock intended for export, and on the Warble Fly pest.

Appendices relating to Disease and Statistics.

Part I.—Position of Great Britain with Regard to Animal Diseases.

No case of cattle plague, pleuro-pneumonia of cattle, sheep-pox, epizootic lymphangitis, glanders or rabies occurred in any part of Great Britain during the year 1929. The country also remained free from dourine. The incidence of the other notifiable diseases is described below.

Foot-and-Mouth Disease.

The procedure in dealing with outbreaks of foot-and-mouth disease during the year under review is that which was described in detail in the report for 1928. It is satisfactory to be able to record a considerable reduction in the number of outbreaks of this disease in Great Britain during 1929. The total of 38 outbreaks was the lowest in any year since 1918, and compares with 138 in

1928, 143 in 1927 and 204 in 1926. No restrictions consequent upon foot-and-mouth disease were in operation in any part of Great Britain for nearly one-third of the year. Of the 38 outbreaks, 32 occurred in England and six in Scotland. There was none in Wales. A total of 1,247 cattle, 1,101 sheep, 1,217 pigs and five goats were slaughtered and £36,377 15s. was paid as compensation to their owners. There were 15 new centres of infection. The origin of the disease in two of these centres was traceable to the outbreaks in another centre. No definite connection was traceable between any of the other 13 centres. These 13 may therefore be classified as resulting from initial outbreaks of foreign origin. In none of these, however, was the actual origin identifiable.

In 10 of the 15 centres there was no spread of infection from the initial outbreak. The Infected Area of 15 miles radius imposed on confirmation of each initial outbreak was reduced to five miles in 13 cases after the lapse of a period of 14 days, and in the other two cases after 19 and 21 days respectively. After a further period of seven days a further reduction of the area to one of two miles radius was made in seven of these cases, and these were freed after 28 days from the date of the original outbreak. Three areas were released within 32 days, and two areas within six weeks. The restrictions in the three remaining areas were entirely withdrawn after 21 days (in two cases) and 22 days (in the third) had elapsed from the date of the initial outbreak. In every instance the policy was pursued of releasing the area so soon as there appeared to be no longer any risk of the spread of infection. The following particulars of individual outbreaks are of interest.

Yorkshire North Riding (Colburn).

Confirmed January 30th. Eleven outbreaks, all connected, occurred at this centre. On one farm 72 pigs were found to be affected, the oldest lesions being estimated at two months. In this case, between January 30th and February 9th, 42 carcasses of pigs were exhumed or discovered in a pond, rubbish heaps, etc., and all had been affected and showed lesions varying from three to six weeks old. Three persons were prosecuted for failing to report disease with all practicable speed, and as a result fines of £50, £20 and £20 respectively were imposed. In exercise of his powers under Section 20 (7) of the Act of 1894 the Minister decided to deduct a proportion of the compensation, amounting to £20 17s. The pigs had been fed on swill obtained from Catterick Camp, where South American meat, Danish bacon and Continental vegetables had been consumed. Although no conclusive evidence could be obtained that the swill was the source of infection, it is a possible origin of the outbreaks.

Southampton (Littleton, Winchester).

Confirmed June 5th, 1929. Three outbreaks occurred in this area. In the two outbreaks confirmed on June 5th and 7th respectively, disease was found to be in an early stage, but in that confirmed on June 8th all the 15 cattle involved were affected, some of them being found to have extensive healed and healing lesions, estimated to be between three and four weeks old.

Lanarkshire (Easter Cadder, Bishopbriggs).

Confirmed September 7th. Disease was found in 96 pigs and two cattle. Six sows were noticed to be lame on August 21st, and the owner's veterinary surgeon, who attributed the illness to change of food, prescribed ointment. By September 6th disease had spread to a large number of pigs, and the veterinary surgeon then reported the case as suspected foot-and-mouth disease. The oldest lesions were found in the pigs and were estimated to be about four weeks old. After the existence of the disease had been confirmed it was ascertained that a sow had died on August 21st; the carcass was exhumed and found to have been affected. This outbreak gave rise to three other outbreaks in this centre and, owing to the movement of pigs to Glasgow Market, infection from this outbreak was considered to be responsible for disease occurring in two other centres, namely Lanarkshire (Public Abattoirs, Glasgow)—confirmed November 23rd, and Stirlingshire (Avonbridge)—confirmed December 17th.

Somersetshire (Chardstock, Chard).

Confirmed October 10th. The circumstances in this case were somewhat unusual and afford a good illustration of the working of the arrangements for dealing with reported cases outside official hours. The report of suspected disease was received by the Ministry at 11 p.m. on October 9th. An Inspector was instructed immediately by telephone and disease confirmed at 3 a.m. on October 10th. Emergency restrictions covering an area of 15 miles radius from the infected place were imposed, and steps were taken to prevent stock reaching Axminster Market, which was due to be held on the morning of October 10th. As a result, the outbreak was confined to one premises.

Kent (Chartham, Canterbury).

Confirmed October 21st. This was an isolated outbreak. Owing to the fact that animals from the infected area had been moved on October 18th to the Dairy Show held at the Royal Agricultural Hall, Islington, an Order was issued requiring the withdrawal and isolation of these animals. The Order also prohibited the movement of animals from the Show except by licence granted by an Inspector of the Ministry and subject to the detention and isolation of the animals for a period of 14 days after the movement.

East Sussex (Westmeston, Hassocks).

Confirmed October 27th. Six outbreaks occurred at this centre. No conclusive evidence was obtained as to the origin of the initial case, but two theories were investigated. The first was that infection came from a stream, from which the animals drank, draining the effluent from a sewage farm on which was a refuse dump. The second theory was that infection had come from imported oats.

The report on foot-and-mouth disease concludes with a copy of a note on the tenacity of the virus of foot-and-mouth disease under field conditions, which was read by the Chief Veterinary Officer at the meeting in Paris in June, 1929, of the International Office of Contagious Diseases of Animals.

BOVINE TUBERCULOSIS.

The returns prepared by the local authorities in Great Britain of animals dealt with under the Tuberculosis Order of 1925 indicate that during 1929, 15,732 animals were reported by their veterinary inspectors as coming within the scope of the Order as regards compulsory slaughter; that is, that these animals were giving tuberculous milk

or were affected with tuberculosis of the udder, tuberculous emaciation, or with a chronic cough accompanied by definite clinical signs of tuberculosis.

These cattle comprised 9,231 cows in milk, 5,937 other cows and heifers, and 564 other bovines.

Of the 15,732 bovine animals, 15,532 were slaughtered by local authorities, 152 died before slaughter could be effected, and 41 were slaughtered by the owners. In two of the remaining seven cases the animals were valued in excess of £50 and the Ministry decided not to authorise slaughter by the Local Authority, the animals being, instead, detained and isolated until slaughtered by their owners; in the other five cases it was agreed on further investigation that the animals did not come within the scope of the Order as to compulsory slaughter, and they were released.

The *post-mortem* examination of the animals slaughtered under the Order showed that 127 (or 0·8 per cent.) were not affected; that 4,534 (or 29·2 per cent.) were affected but were not in an advanced condition; and that 10,870 (or 70 per cent.) were affected by the disease in an advanced state.

Of the total number of affected bovine animals, the percentage of "advanced" cases in 1929 was 70·5, as compared with 72·3, 72·5 and 73·2 in 1928, 1927 and 1926 respectively.

Post-mortem examinations were also held on three other animals, one of which had died before slaughter could be carried out by the local authority, the other two animals being slaughtered by their owners. These were found affected. The conclusions reached in regard to the 15,407 animals found affected with tuberculosis indicated that:—

(i) 294 were reported milk cases showing lesions of tuberculosis, *but not in the udder.*
(ii) 2,398 were suffering from tuberculosis of the udder.
(iii) 6,568 were suffering from tuberculous emaciation.
(iv) 6,147 were otherwise affected with tuberculosis.

The compensation paid by local authorities for animals slaughtered during 1929 amounted to £59,164 16s. 4d., or an average of £3 16s. 2d. per animal, as compared with £58,751 13s. 2d., or an average of £3 10s. 1d. per animal dealt with in 1928, and £58,872 8s. or £3 7s. 9d. per animal in 1927. This rise in the cost of compensation per animal is due to the decline in the proportion of "advanced" cases.

Fewer animals were slaughtered under the Order during 1929 than during the previous year by the English and Welsh local authorities, the decrease in the number being 1,338 and 32 respectively. In Scotland, however, the number of animals slaughtered increased by 143.

The provisions of the Diseases of Animals Act, 1925, entitle the local authorities to a repayment from the Ministry of 75 per cent. of the gross compensation paid by them in respect of animals slaughtered under the Order. The amount paid or due to be paid to local authorities during 1929 was, therefore, £44,373 12s. 3d., the amount of compensation borne by them being £14,791 4s. 1d.

Local Authorities also received as proceeds from the sale of carcasses of slaughtered animals a total sum of £17,873 11s. 9d., which exceeded by £3,082 7s. 8d., the proportion (one-fourth) of the compensation borne by them.

On the 18,780 premises in Great Britain on which disease was reported to exist or on which were cows reported to be giving tuberculous milk, there were 621,396 bovine animals (including 475,972 cows and heifers). Of these, 203,768 cows and heifers and 37,484 other bovine animals, or a total of 241,252 animals, were examined. The total number of animals found on *post-mortem* examination to be affected with tuberculosis, at a stage coming within the scope of the Order as to compulsory slaughter, was 15,407 (or 2·5 per cent.) of the bovine animals on the premises or 6·3 per cent. of those actually examined. The number of cows and heifers certified to be affected was 14,858, and of these 2,692 were stated to be affected with tuberculosis of the udder or giving tuberculous milk. The number so affected represented only 0·57 per cent. of the total number of cows and heifers on the premises inspected.

The Tuberculosis Order of 1925 was neither designed nor expected to eradicate tuberculosis completely from bovine animals in this country. In the present state of knowledge that object cannot be achieved in a short space of time, without a great and sudden depletion of the herds of this country and very large expenditure in compensation. The Order was designed to remove as far as possible a source of immediate danger to human health, and at the same time to reduce the number of infected animals able to spread the disease among other animals. The Order deals, therefore, with tuberculous animals as falling into two distinct categories: (*a*) cows giving tuberculous milk, which are dangerous to human beings as well as to other animals, and (*b*) bovine animals freely excreting tubercle bacilli in other ways, which are the main source of the disease among animals. It is to be taken not as representing a policy of complete eradication, but as a measure complementary to the Milk and Dairies Acts and Orders.

The Tuberculosis Order of 1925 requires certain forms of the disease to be reported by the farmer, but it is not to be expected that the full benefit will be obtained from the working of the Order until an organisation has been developed for searching out cases of the disease. Such an organisation would be costly, as it would involve a considerable extension of periodical veterinary inspections of all dairy cows, coupled with the application of the biological test.

In England and Wales the number of premises on which disease was found on veterinary enquiry to exist in one of the forms scheduled in the Order has gradually declined from 14,452 in 1926 to 12,133 in 1929 and the number of animals slaughtered as affected from 15,551 in 1926 to 12,931 in 1929—a reduction of 2,620 animals, or 16·8 per cent. This reduction is accounted for amongst the emaciation cases and those with chronic cough and clinical signs of disease. On the other hand, the number of animals slaughtered on account of tuberculosis of the udder or giving tuberculous milk increased from 2,095 in 1926 to 2,313 in 1929; in other words, the percentage of milk and udder cases amongst cows and heifers found affected increased from 14·3 per cent. in 1926 to 18·6 per cent. in 1929. This is doubtless due to the greater activity of Local Authorities in the administration of the Milk and Dairies Acts and Orders. The percentage of "advanced" cases amongst animals slaughtered was reduced from 72·1 per cent. in 1926 to 69·9 per cent. in 1929, with a corresponding increase in the "non-advanced" cases.

In Scotland, the Order was not at first uniformly administered, and in consequence the year 1926 is not suitable for purposes of comparison. Since 1927, however, the number of premises on which disease was found to exist has increased from 2,246 to 2,498 in 1929 and the number of animals slaughtered as affected from 2,323 in 1927 to 2,601 in 1929. The number of animals slaughtered in Scotland on account of tuberculosis of the udder or giving tuberculous milk has not, however, changed appreciably during the last three years. The figure was 373 in 1927 and 379 in 1929. As in England and Wales, the proportion of " advanced " cases has been reduced considerably, *i.e.*, from 74 per cent. in 1926 to 70·2 per cent. in 1929, with a corresponding increase in non-advanced cases.

To sum up, the effect of the Order appears to have been to reduce progressively the proportion of cases of generalised tuberculosis throughout Great Britain. In England and Wales the result of the increased inspection of dairy herds is manifesting itself in the increasing number of " infected milk " and " udder " cases discovered, whilst in Scotland the campaign in this latter respect is not yet showing the same progress.

Sheep Scab.

There were 666 outbreaks of sheep scab in Great Britain during the year 1929—a reduction of 78 outbreaks as compared with 1928. These were divided between England, Wales and Scotland as follows :—

England 318 (an increase of 11 over 1928).
Wales 308 (a reduction of 50).
Scotland 40 (a reduction of 39).

In England, the following counties were chiefly involved :—Cumberland (19), Lancashire (16), Leicestershire (17), Lindsey (38), Norfolk (23), Salop (30), Yorks. E.R. (23), Yorks. W.R. (36).

In Wales the number of outbreaks for the whole year is 46 per cent. of the total number of outbreaks in Great Britain, and the position of the Principality with regard to this disease must still be regarded as very unsatisfactory.

The four counties Caernarvon (70 outbreaks), Montgomery (64), Merioneth (60), and Denbigh (49) accounted for 243 out of the total of 308. Of these counties Merioneth doubled the number of its outbreaks (from 31 to 60), and 25, or nearly one-half, were detected by Inspectors of the Ministry.

The position in Scotland shows a further very substantial improvement, the number of outbreaks having been reduced from 79 to 40, and this improvement was reflected in the small number of outbreaks in other parts of Great Britain originating in sheep exported from Scotland, of which there were only three during the year. In Inverness, 16 outbreaks were confirmed (against 26 in 1928), all in the Outer Islands; of these, 13 were discovered by Inspectors of the Ministry during the prescribed double-dipping period.

The Ministry itself devoted special attention to the badly-infected areas with a view to localising the incidence of the disease and intensifying the measures taken to eradicate it. For these purposes a number of Inspectors was allocated to assist the officials of the Local Authorities, in supervising the dipping operations in the counties of North Wales, and in Lindsey, Lancashire, West Riding of Yorkshire, Breconshire, and the Outer Islands of Inverness-shire.

Seventy-nine outbreaks of sheep scab were detected during the year by Inspectors of the Ministry and 113 by Inspectors of Local Authorities, a total of 192, or 28 per cent. of the total number of outbreaks in Great Britain.

A number of these cases were doubtless difficult to detect except by a person specially engaged in searching them out, but, allowing for a proportion of cases of this kind, so high a percentage of non-reported outbreaks indicates still a serious disinclination on the part of many of the owners concerned to tackle the problem of eradication earnestly or to avail themselves of the only measures which can promise success in reducing the prevalence of this disease, namely, prompt detection and reporting of cases followed by efficient treatment as prescribed in the Sheep Scab Order of 1928. The improvement which is shown by the reduced number of outbreaks in 1929 as a whole affords, however, some grounds for believing that the appeal broadcast to all stockowners in April, 1929, for greater enthusiasm and co-operation in the attempt to eradicate scab is meeting with some response and encourages the hope for a more substantial improvement in the early future. A greater activity is being displayed by many Local Authorities in the enforcement of the regulations generally.

The Section of the Report dealing with sheep scab includes a note on the Survival and Spread of Sheep Scab.

Sheep Dips.—On December 31st, 1929, the total number of approved dips was 312, of which 87 were arsenical, and 225 non-arsenical; of the latter, 221 were tar acid dips, three sulphide, and one tobacco. The 87 arsenical dips include eight dips containing arsenic but depending on their tar acid content for the efficacy against sheep scab.

Swine Fever.

The number of reported outbreaks of swine fever enquired into during the year was 12,325, of which 2,981 (24·2 per cent.) were confirmed after veterinary examination on the premises and at the Ministry's Laboratory. Of the 2,981 confirmed outbreaks, 2,765 occurred in England, 155 in Wales and 61 in Scotland.

In 2,173 of the confirmed outbreaks in 1929 the diagnosis was established at the first visit. In the remaining 808 cases (27·1 per cent.) two or more visits were necessary to establish the existence of the disease.

The power to slaughter swine affected with or suspected of swine fever is exercised only where necessary for the purpose of establishing the diagnosis. The number of swine slaughtered by the Ministry's Inspectors for diagnostic purposes in connection with the 12,325 reported outbreaks of swine fever investigated during 1929 was 3,677 as compared with 2,198 slaughtered in 1928, and the compensation paid to the owners amounted to £4,117 17s.

There was an increase of 2,367 reported cases and an increase of 1,509 confirmed outbreaks as compared with the year 1928 for Great Britain as a whole.

The increase occurred mainly in England. In Wales the only county seriously affected was Glamorgan, whilst in Scotland the number of outbreaks was not abnormal. The counties in Great Britain worst affected were Essex (with 171 outbreaks), Kent (with 244), Suffolk (with 364), and Glamorgan (with 111).

UMI

In the early part of the year the number of outbreaks in England was comparatively low. During May and June, however, the outbreaks soared rapidly, but showed signs of subsiding in August. They rose again rapidly in October and November, reaching the peak in the latter month, but the position thereafter gradually improved.

It has not been possible to discover any definite cause for the sudden increase in the prevalence of the disease. Swine fever has always been subject to somewhat violent fluctuations and periods occur when a wave of the disease spreads over parts of the country for no apparent reason. The history of the affected swine was traced by Inspectors of the Ministry in 2,769 outbreaks, or 93 per cent. of the total. These enquiries showed that 494 outbreaks (16·5 per cent.) were due directly to market infection, and that in 1,351 other outbreaks (45·3 per cent.) the affected pigs had recently passed through a market and may have acquired infection by that means. It seems probable, therefore, that market infection was, as is usual, one of the most fruitful sources of the spread of infection in 1929. It is possible that, in addition, the increased use of motor transport, which renders more difficult the administration of the Regulation of Movement of Swine Order, of 1922, may be a contributory cause, and in Kent the movements of fruit pickers may also have contributed to the spread of infection. Direct connection between outbreaks in which markets were not involved was traced in 341 cases (11·4 per cent. of the total).

The measures which are normally relied upon for the control of the disease are:—

(*a*) The Swine Fever Order of 1908 and amending Orders, which require the strict isolation of every infected herd until the disease has been eradicated; and

(*b*) the Regulation of Movement of Swine Order of 1922, which imposes general restrictions on the exposure of pigs at markets within, and on the movement of pigs out of, that part of Great Britain in which swine fever is, generally speaking, most prevalent.

When the Ministry's Veterinary Inspector visits premises to enquire into a reported case of swine fever, he advises the owner as to whether the case is suitable for the treatment of the swine by serum injection with the object of preventing the spread of infection amongst the herd, and hands the owner a copy of the leaflet (A. 21/T.A.) which contains general advice to the owners of affected herds.

In view of the difficulties sometimes met with in the differential diagnosis between acute swine fever and acute swine erysipelas, the Ministry's Inspectors are instructed that when any doubt exists, smears are to be made from freshly-cut surfaces of spleen and liver, and forwarded to the Veterinary Laboratory for examination. In such cases, leaflets on swine fever and swine erysipelas, containing advice to owners of infected herds, are handed to the owner, and he is informed that as soon as a definite diagnosis can be made at the Laboratory, he will be advised by telegram, so that he may consult his veterinary surgeon as to whether to adopt either of the protective inoculations advised in the leaflets. When an inspector is able to make a definite diagnosis at once, the appropriate leaflet is handed to the owner, and the protective inoculation advised therein is explained to him.

The area scheduled in the Regulation of Movement of Swine Order of 1922 includes the whole of England except Northumberland, Cumberland, Westmorland, Lancashire, Cornwall and Devon. Of the total number of outbreaks in Great Britain during 1929, 2,619 (or 87·8 per cent.) occurred in this Scheduled Area.

Since the operation of the Regulation of Movement of Swine Order of 1922, it has been the Ministry's policy to avoid super-imposing special infected area restrictions if possible, in view of the inconvenience involved to the pig trade. In consequence, however, of the seriousness of the disease position, Orders were made by the Ministér at various dates between October 17th and December 9th, 1929, imposing special infected area restrictions in the whole or parts of the counties of Suffolk, Kent, Essex, Hertfordshire, Isle of Ely, Huntingdon and Glamorgan. These restrictions prohibited the movement of swine into or out of the areas scheduled, or on any highway, whether by water or road, within those areas, except by licence which, unless the pigs were intended for slaughter, was only granted where the pigs had been on the premises for 28 days and required that the pigs should be again detained at the place of destination for a further period of 27 days. All markets of store pigs in these areas were prohibited.

A marked reduction in the prevalence of swine fever followed the imposition of these restrictions.

Anthrax.

During the year 439 outbreaks of anthrax were confirmed, a decrease of 97 (or 18·09 per cent.), as compared with 1928. Of the total, 223 occurred in England—the same figure as in 1928; 213 in Scotland, a decrease of 92; and three in Wales, a decrease of five.

The number and species of animals affected were:—491 cattle, three horses, six sheep, 26 swine and three dogs.

The disease occurred four times on one premises, three times on five premises, and twice on 27 premises. That is to say, in 40 outbreaks on 33 separate premises the disease may have arisen from a previous outbreak in the same year. In addition to these 40 outbreaks, 60 cases occurred on premises on which disease was known to have occurred within the previous five years, thus making a total of 100 possible recurrences, as compared with 143 in 1928.

The probable sources of infection in those outbreaks (339 in number) which occurred on previously clean premises include effluent from tanyards contaminating streams; use of imported feeding stuffs; use of artificial manure of animal origin; and use of shoddy as litter.

In 52 outbreaks (11·8 per cent., as compared with 11 per cent. in 1928) ailing animals were slaughtered or unnecessary shedding of blood took place, in attempts to salvage the carcass. In 25 of these cases disease was not reported until the carcasses had been removed to slaughter-houses or knackers' yards.

The Anthrax Order of 1928 strengthened the regulations previously in force by imposing an automatic prohibition, immediately the existence of the disease in any case is suspected, against the cutting of the skin of a diseased or suspected carcass or in any other manner causing an effusion of blood. The strict enforcement by local authorities of this prohibition is of great importance in controlling the disease and effecting a reduction of the number of cases, having regard to the fact that 100 outbreaks out

of the total of 439 in 1929 (or 22 per cent.) were due to previous cases.

At the end of the section relating to anthrax is printed a copy of a paper on the introduction into Great Britain of anthrax infection by means of products of animal origin, which the Chief Veterinary Officer read at the meeting in Paris in June, 1929, of the International Office of Contagious Diseases of Animals.

GLANDERS.

A new Order, entitled the Glanders or Farcy Order of 1929, was issued in August and came into force on September 1st, 1929. The circumstances surrounding some of the cases certified under the Glanders or Farcy Order of 1920 by veterinary inspectors of local authorities were such as to suggest an element of doubt as to whether the disease from which the horses were suffering was in fact glanders, and the main reason for making a new Order was to secure that in any future reported case confirmation of the existence of disease should rest with the Chief Veterinary Officer of the Ministry after examination of material at the Ministry's Laboratory.

PARASITIC MANGE OF EQUINE ANIMALS.

The steady and continuous decline in the prevalence of this disease was continued in 1929. Outbreaks numbering 204 in 42 counties were reported by local authorities, as compared with 280 outbreaks in 51 counties in 1928; that is, a reduction of 27 per cent. The number of horses attacked in 1929 was 392, or 1·9 per outbreak, as against 578, or 2·06 per outbreak, in 1928.

In England the number of outbreaks dropped from 254 in 1928 to 182 in 1929. The most striking reduction occurred in the County of London, where only nine outbreaks were reported, as compared with 29 in 1928 and 65 in 1927.

In Wales there were three outbreaks in one county, and in Scotland 19 outbreaks occurred in five counties, as compared with 22 outbreaks in nine counties in 1928. Eleven of the outbreaks in 1929 occurred in the county of Dumfries.

Part II.—Importation, Exportation and Transit of Animals. Protection of Animals and Poultry during Transit.

EMBARGO ON MEAT FROM THE CONTINENT OF EUROPE.

A careful review was made by the Minister during the latter part of the year of the circumstances under which the embargo on fresh meat from the Continent of Europe was imposed and was being maintained, and the decision was reached that the embargo was necessary for the purpose of the protection of the livestock of this country from disease. The benefit resulting from the embargo in reducing the sources of infection from the Continent is clearly shown from a study of the figures of the number of outbreaks of foot-and-mouth disease in Great Britain which were of foreign origin during the twelve months before the date on which the embargo was imposed, *viz.*, 45, and the number of such outbreaks in each similar period since that date. In the twelve months immediately following the imposition of the embargo the figure was 22, while in the year ended May, 1930, the number was six.

South American Meat.—Special measures have been taken by the South American Governments, at the instance of His Majesty's Government, to prevent the risk of foot-and-mouth disease being conveyed to this country by chilled or frozen meat from South America. According to Decrees of the respective governments, it is now officially recognised that the Official Stamp affixed to all meat exported to Great Britain from Argentina, Uruguay and Brazil, signifies that the meat is from animals which, on examination at the time of slaughter, presented no symptoms of foot-and-mouth disease, and which had come from a troop of animals in which no disease had been found.

IMPORTATION OF CATTLE FROM ABROAD.

No cattle were imported from Canada or the United States during 1929 for slaughter at an Imported Animals Wharf, but from Southern Rhodesia 692 fat cattle were imported for slaughter at the Birkenhead Wharf. These were required, after veterinary examination, to be slaughtered within the Wharf within ten days after their landing. There were no cases of disease amongst these cattle. For the first year since the embargo on the importation of Canadian store cattle was raised by the Importation of Animals Act of 1922, no store cattle from Canada were landed during the year 1929.

IMPORTATION OF PEDIGREE ANIMALS.

The importation of one Corriedale ram and ten Corriedale ewes was authorised. The sheep, after having completed 28 days' quarantine in this country, were released in good condition.

Permission was granted for the importation of a pure-bred registered Afrikander bull and two cows for presentation to His Majesty the King. A period of three months' quarantine from the date of shipment from South Africa was required, and this was completed by the animals on approved quarantine premises at Southampton. The cattle were finally released from restrictions in good condition and proceeded to the Royal Farms at Windsor.

An Order was issued, on the application of the National Pig Breeders' Association, authorising the importation of three pedigree Tamworth boars and three sows from Canada, subject to certificates of registration and health, and to quarantine on arrival in this country. The swine on arrival were moved to approved quarantine premises at Glasgow and isolated for a period of 20 days, after which, as they were still free from disease, they were released.

IMPORTATION OF ANIMALS FOR EXHIBITION OR OTHER EXCEPTIONAL PURPOSES.

Authority was given for the importation of the following ruminating animals for exhibition or other exceptional purposes, subject to quarantine for a period of 28 days in each case. No case of contagious disease occurred amongst any of these animals. Four antelopes from Africa; three reindeer from Norway; two Rocky Mountain sheep from Canada; 15 deer from India; two Tibetan sheep from India; two musk oxen from Norway; one goat (Regimental Mascot) from the Rhine; one goat from United States; two sheep from Sierra Leone; 40 llamas from Argentina; three gayals from India; three antelopes and two gazelles from Tanganyika.

IMPORTATION OF ANIMALS FROM IRELAND, THE CHANNEL ISLANDS AND THE ISLE OF MAN.

There were 880,332 cattle, 670,723 sheep and 267,521 pigs landed from Ireland, the Channel Islands and the Isle of Man during 1929.

Animals from Ireland, Channel Islands and the Isle of Man, are required to be landed at landing places approved by the Ministry as suitable from the point of view of the

prevention of the spread of disease. The animals have to be detained therein for a minimum period of ten hours for veterinary examination and rest and are then licensed by the Inspectors of the Ministry at the ports, either direct or through one market, to premises for detention for six days or to a slaughterhouse. The object of the six days' detention is to obviate the risk of the spread of disease involved in the former trade practice of rushing imported animals from market to market immediately after landing for the purpose of their disposal.

Cases of Diseases in Imported Animals.

The only cases of scheduled notifiable diseases found amongst imported animals in the landing places were those of tuberculosis in certain bovine animals and sheep scab in sheep from Ireland and the Isle of Man.

Tuberculosis in Imported Animals.

During 1929, 31 animals were detained at various landing places. Of these animals ten came from ports in Northern Ireland, 19 from ports in the Irish Free State, and two from the Isle of Man. The animals were slaughtered by the owners before or after examination. *Post-mortem* examination showed that 20 were affected with advanced tuberculosis and four with tuberculosis (not advanced). Twelve of the animals were suffering from tuberculosis of the udder, six from tuberculous emaciation, and six were otherwise affected with tuberculosis.

In addition to the above, eight animals which were found to be suffering from induration of the udder or other chronic disease of the udder, were prevented from landing. These animals were shipped from the Irish Free State, and were slaughtered on board the vessels by or on behalf of their owners.

Sheep Scab in Imported Animals.

The existence of sheep scab in 101 sheep from Ireland and in 12 sheep from the Isle of Man was detected in the landing places by the Ministry's veterinary inspectors.

The affected sheep were not allowed to be removed from the landing places until they had been cured of the disease as provided in the Animals (Landing from Ireland, Channel Islands and Isle of Man) Order of 1923, and all sheep which had been brought into contact with infection, either on the importing vessel or otherwise, were required to be dipped twice in an approved dip before coming into contact with other sheep, once in the landing place and again at the place of destination within 14 days of the first dipping.

Foreign Hay and Straw Orders.

Five special licences were issued in 1929 authorising the landing of (1) three consignments of samples of grass from Kenya for the purposes of chemical analysis; (2) a consignment of green flax straw from Belgium for experiments in fibre making; and (3) a consignment of rice straw from Italy for research purposes. The conditions attached to these landing licences required, *inter alia,* that the straw, etc., should not be brought into contact with any animal in Great Britain and that the residue from the experiments should be destroyed by fire or thoroughly disinfected with an approved disinfectant.

In addition, eight licences were issued authorising the landing of dunnage straw for the purpose of destruction at the landing wharf under proper supervision; the straw in all these cases had been used for packing empty bottles imported from Germany.

Importation of Dogs, Cats and other Canine and Feline Animals.

Shortly before the commencement of the evacuation of the British Forces of the Rhine, and with the concurrence of the Ministry, the Royal Society for the Prevention of Cruelty to Animals entered into an arrangement to facilitate the importation, for quarantine at the Dogs' Home, Hackbridge, Surrey, of dogs and cats belonging to members of the British Forces and also to civilians returning from the Rhine. The Society arranged with the Ministry for the issue of the requisite landing licences and accepted responsibility for the landing of the animals in crates and their conveyance by motor-lorry, under the control of an inspector of the Society, to the place of detention. The fee charged by the Society to the owner of each animal, in respect of such movement and towards the cost of quarantine, was £8 in the case of officers or civilians of corresponding status, and £2 in the case of non-commissioned officers and men or civilian employees. The balance of the cost in each case was defrayed by the Society. The animals were landed at Dover, the first consignment arriving on September 24th, and the final consignment on December 10th. In all, 146 dogs and five cats were imported under the scheme by 21 officers and 89 non-commissioned officers and men, and by 39 other persons.

Inclusive of the above-mentioned animals from the Rhine, the total numbers of domestic dogs and cats landed in Great Britain from abroad during 1929, under licences of the Ministry, requiring quarantine on veterinary premises were 1,051 dogs and 58 cats.

In addition to the dogs and cats imported for detention on veterinary premises, eight dogs and one cat were landed for re-export within forty-eight hours, whilst 43 dogs were imported under the special conditions attaching to performing dog licences.

Ten dogs and six cats were landed in contravention of the Importation of Dogs and Cats Order of 1928. Proceedings were taken in four cases and fines amounting to £18 5s. were imposed.

During December, 1928, representations were received by the Ministry from Shipping Companies and other bodies regarding the difficulty of complying with Article 8 (1) (*a*) of the Importation of Dogs and Cats Order of 1928, which requires that every imported cat not accompanied by a licence of the Minister authorising its landing must at all times, while on board a vessel in any port in Great Britain, be confined in an enclosed part of the vessel from which it cannot escape. It was represented that the freedom of movement of ship's cats on board a vessel while in port was essential for the purpose of deratization and that the effect of the above-mentioned Article would be to obstruct the work of keeping ships free from rats. After discussion with the Board of Trade and the Ministry of Health, the Ministry intimated to the Shipping Companies that it would be prepared to amend the Order so as to allow cats freedom of movement on board ship whilst in port, provided that effective measures could be taken to prevent the cats leaving the ship whilst in a British port. The companies were unable, however, to suggest any method of carrying out this object, other than that provided in the Order, and the question of

amending the Order was in consequence dropped.

The number of canine animals other than the domestic dog imported during 1929 was 297, of which 228 were silver-black foxes imported for breeding purposes, with the ultimate object of the production of fur. In addition 42 blue foxes were imported for the same purpose. The remaining 27 canine animals comprised four other foxes, three jackals and 16 wolves, together with four hyenas, the last-mentioned species being included in the definition of "canine animal" in the Order. The number of feline animals other than the domestic cat imported during the year was 179. These included 123 lions, 31 tigers, nine leopards, four pumas and three cheetahs.

Five licences were also issued authorising the landing in Great Britain, for immediate re-exportation, of two lion cubs, 33 foxes, one panther cub and one leopard cat.

Rabies.

One case of rabies in an imported dog occurred during the year. A Sealyham bitch from India arrived at Liverpool on April 27th. The six months' quarantine period expired on November 1st, but as on this date the bitch was observed to be "in season" she was kept confined in the quarantine kennels, and not allowed to come into contact with any other animals. On the morning of November 25th she was observed to be dull and refused her food. She rapidly became worse, developing symptoms suggestive of rabies; she moved with a staggering gait and had a peculiar vacant look. Symptoms of paralysis of the pharynx developed, soon followed by paralysis of the hindquarters, retching and complete postration, coma and death following on November 27th. Examination of the brain and cervical ganglia at the Ministry's Laboratory confirmed the existence of rabies. As the conditions of quarantine had never been relaxed up to the time of death, the case was treated as occurring during quarantine.

Enquiries as to the possible origin of infection showed that it was unlikely that the bitch became infected whilst on the voyage from India. Five other dogs travelled on the same boat, and these were all perfectly healthy during the period of quarantine and when released. The bitch is stated, however, by her owners to have been bitten about thirteen months prior to her death, whilst in India, in a fight with a stray dog. There is no evidence to show whether the stray dog was rabid or not, and it is possible, of course, that the bitch may have been bitten at a later date unknown to her owners. If, as seems likely, the bite above referred to was the cause of the bitch becoming infected, such a long incubative period is very rare, although not unprecedented.

Exportation of Horses.

During the year, 9,912 horses were shipped from Great Britain to the Continent of Europe. In addition, 1,520 horses were rejected by the Port Veterinary Inspectors of the Ministry when the animals were presented for examination, as not being up to the standard of fitness required by the Acts.

Only eight casualties occurred amongst the animals shipped to the Continent in 1929.

During the year, seven permits, involving the export of nine horses, one ass and three ponies, were issued exempting the animals in question from veterinary examination before shipment. Such permits are only issued in those cases in which the Ministry is satisfied as to the class, value and destination of the animal.

According to information supplied by the Jockey Club, nine certificates were issued by them in respect of thoroughbred horses shipped to the Continent for racing or breeding purposes.

The number of horse carcasses shipped from Great Britain to Belgium, France and Holland during 1929 was 45,095.

Part III.—The Veterinary Laboratory, New Haw, Weybridge, Surrey.

During the year, 5,507 specimens were received at the Laboratory for purposes of diagnosis in suspected cases of the diseases dealt with under the Diseases of Animals Acts, in which the diagnosis rests with the Ministry, 4,737 being for swine fever, 670 for anthrax, 93 for sheep scab and seven for rabies.

In the case of sheep scab, the only cases dealt with at the Laboratory are those discovered by the Ministry's veterinary inspectors in the field and cases in which the owner has appealed against the diagnosis of the veterinary inspector of the local authority.

In addition to the above specimens, 2,780 were examined from animals and poultry which were not suspected of being affected with any of the diseases dealt with under the Diseases of Animals Act.

Doses of anti-abortion "A" vaccine numbering 23,620 were supplied to veterinary surgeons for the inoculation of animals in herds affected with epizootic abortion. Agglutination tests to the number of 908 were carried out for the diagnosis of bovine abortion. In the case of poultry, 30,030 agglutination tests were conducted.

In addition, 1,120 doses of Calmette-Guérin vaccine against tuberculosis were issued to owners of selected herds for inoculation.

Part IV.—Miscellaneous.

London Quarantine Station for British Pedigree Stock Intended for Export to Dominions and Colonies

The London Quarantine Station was established in April, 1928, at the East India Dock, for the purpose of promoting the export of British pedigree stock to the British Dominions and Colonies free from risk of the conveyance of foot-and-mouth disease by such stock.

Apart from one period of five weeks during the autumn, when the Station was unoccupied, the average period of unoccupancy in 1929 between each of the 15 consignments which passed through the Station was only three days. Fifteen consignments of animals were admitted during the year. These 15 embraced a total of 699 animals, consisting of 427 cattle (including one calf), 176 sheep, 91 pigs and five goats. During the year one heifer died in the Station, the cause of death being septicæmia. One bull developed parasitic mange and was refused acceptance by the importing Dominion, and one heifer was not accepted by the shipping company owing to the fact that the animal was in an advanced state of pregnancy. Steps have been taken to avoid a recurrence of such cases as far as practicable. Of the total number admitted to the Station, 18 cattle came direct from premises in Jersey and 11 from premises in Guernsey. The remainder of the animals came from premises in Great Britain.

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Vet. 53

The number of inspections of animals at premises in Great Britain, prior to their admission to the Quarantine Station, by Veterinary Inspectors of the Ministry, was 284, and 15 and 7 visits of inspection respectively were made to premises in Jersey and Guernsey by Veterinary Inspectors of the Governments of those islands. The largest consignments in quarantine at the same time were 49 cattle and 18 sheep on one occasion and 47 cattle and 25 sheep on another.

Part IV of the Report concludes with a note on the Warble Fly Pest, which includes a brief account of the voluntary steps which have already been taken to deal with the pest both in Great Britain and Ireland.

Appendices.

The Appendices include a copy of a Leaflet (A.21/T.A.) giving advice to owners of herds infected with swine fever and a copy of a Circular Letter, issued on August 8th, 1929, to all Local Authorities on the new Glanders or Farcy Order of 1929. Statistical Tables relating to (*a*) Pedigree Stock exported through the London Quarantine Station; (*b*) Diseases amongst animals in Great Britain; (*c*) Animals in Great Britain and Animals Imported and Exported and (*d*) Animal diseases in European countries, are also printed as Appendices to the Report. All these statistics contain much interesting information.

Review.

[**Technik der Haar- und Wolluntersuchung.** By Kronacher, Dr. Carl, Professor Agricultural College, Berlin, and Director, Institute for Animal Breeding and Genetics of Domesticated Animals, and Lodemann, Dr. Georg, Agric. Dip. Hannover. Berlin. Urban and Schwarzenberg, 1930, pp. vi.+432.]

This work was written at the request of the editor of "Handbuch der biologischen Arbeitsmethoden" and forms part of that great work (Abt. VII, Teil 2, Lfg. 316). The author's aim has been to produce a volume of reasonable size which would yet deal with the various aspects of the subject of hair and wool examination in sufficient detail to meet requirements. The actual subject matter of the book is divided into seven sections, as follows:—The preparation of the material, the examination of individual hairs both macroscopically and microscopically, chemical examination, mechanical examination, examination of the individual hair constituents, the characteristics of hairs of different species of animal, the examination of the total hair covering or of shorn wool, the skin as a habitat for hair, and finally, deviations of shape and development of hair due to injury, illness or other disturbing factors. In the section describing the examination of individual hairs, which is by far the largest section, comprising roughly one-third of the whole book, there are detailed directions for the microscopical examination of the structure of hairs by means of polarised light, dark ground illumination, Röntgen rays and rays of short wave-length.

The text is illustrated with 214 figures and a bibliography of 36 pages is appended, followed by a subject index.

D. K.

Abstract.

[**A Contribution to the Study of Sexual Psychoses of Animals.** Dr. Otto Dehner, *B.T.W.*, XXXXVI, No. 22, p. 341.]

This is a communication from the veterinary-medical clinic of the University of Giessen.

Abnormalities (disorders) of sexual functions occur not infrequently in our domestic animals. They are, however, mostly anatomical in their origin, although they also can be functional. The author deals exclusively with the latter. The evidence that sexual disorders in animals are of psychogenic origin is very scanty, owing to the difficulty of establishing a correct diagnosis of this nature. Most of the press communications on this subject were nothing else but case reports made by medical men and zoologists, *par excellence*, who were not properly qualified to place a correct interpretation upon facts observed. To avoid the possibility of wrong conclusions in future, veterinarians, who possess a better knowledge of physiology and pathology of sexual life of animals and their psychology, should pay greater attention to these abnormalities, as was the case hitherto.

The question can be conveniently discussed under three heads:

(1) Anomalies connected with the awakening and extinction of sexual impulse—paradoxia of libido.

2. Anomalies of the relative strength of the libido—sexual anæsthesia, hypoæsthesia and hyperæsthesia.

3. Anomalies connected with the object of sexual activity—perversions of the libido.

The time of awakening and extinction of libido varies a great deal and depends on the breed, management, feeding and constitution of animals. It is extremely difficult to draw a line between the physiological and pathological manifestations. Jumping and riding other male and female animals of the same or another species, so often observed among young animals, should be regarded as a mere playfulness. Weston describes a case of a six-months-old foal which jumped at its mother and which, on account of constant jumping and riding of other foals and calves, had to be castrated at the age of three months. Data on the success or failure following castration are lacking. The same author describes a two-months-old foal which masturbated. In this case, probably one deals with imitation, as it had seen other older masturbating animals.

A conspicuous premature extinction of libido is often observed in animals. The reason for that should be almost exclusively sought in an excessive service, faulty feeding and management, and in pathological condition of genitalia. Strong sexual desire exhibited very often by old animals (dogs) can be attributed to pathological changes in the genitalia.

Sexual anæsthesia, observed in animals as a pronounced hypoæsthesia, occurs but seldom. For the greater part it is the result of some diseased condition. Undoubtedly there are dogs, mares, stallions and bulls, which exhibit from early days onwards—striking sexual frigidity. In this case one probably deals with the psychogenic anomalies caused apparently by enforced abstinence, sexual ignorance, and faulty management.

Incomparably more frequent are cases of abnormal increase of libido. This is but seldom of psychogenic origin. Sexual hyperæsthesia is mostly caused by pathological changes in the female and male genitalia. Abnormal increase of libido in animals may be of psychic and organic origin. Nearly every case of sexual hyperæsthesia was indiscriminately described as nymphomania or satyriasis without making clear that between the former and both latter conditions there are degrees of differentiation. Admittedly, in this condition also, it is extremely difficult to draw the line between the physiological and pathological state. Therefore, it would be desirable to describe as satyriasis and nymphomania only the highest degree of sexual hyperæsthesia. The fact that some nymphomaniac animals in the course of disease show modifications of secondary sexual characters, while with others this is not the case, is a proof that, etiologically, one deals with heterogenous conditions. Uncertain success of operative treatment is a proof that in some cases the disease is of psychic origin, and, in others, of organic origin. Incidence of hyperæsthesia of central origin, according to Dexler, is much rarer than was hitherto assumed.

Perversions of the libido play a rather unimportant rôle. These can be conveniently grouped, by analogy with human beings, under various headings: (*a*) sadism, masochism, fetichism, exhibitionism; (*b*) homo-sexuality, pædophilia, zoophilism, and auto-erotism.

No data are available in veterinary literature on the incidence of sadism in animals. Only one case reported by Villemin [quoted by Dexler] comes to anything near it. But the fact that a dog killed only those fowls which resisted its attempts at copulation is a proof that also in this case one deals purely with a precociously developed libido in a three-months-old dog. Rough handling of the female, such as one sees sometimes in animals, should rather be regarded as an expression of high sexual desire than that of sadism. Attempts at intercourse sometimes observed between guinea-pigs, rabbits and dogs should be put down, not to sexual hyperæsthesia, but to gross ignorance and stupidity.

Passive algolagnia, or so-called masochism, was not observed in animals.

Of the genuine fetichism, in the sense of an abnormality common to man, among the animals one cannot speak. It was observed that some male animals will not serve, or will do so only unwillingly, certain breeds or females of certain colour. However, it is extremely difficult to draw the line between the physiological and pathological in these cases.

Exhibitionism was not observed in animals. The occurrence or absence of homo-sexuality in animals is of first-rate importance for the veterinary surgeon. Karsch reviewed all cases of homo-sexuality in animals reported in the literature up to 1900. Among equines homo-sexual acts occur but seldom. Cows and bulls often ride other cows and bulls in the same herd. There are numerous reports of homo-sexual acts in goats and sheep. Without exception, all these cases occur among animals that had no access to the animals of opposite sex, and were kept together with the animals of their own sex only. Homo-sexuality is very prevalent among male dogs and monkeys. Discussing this question further, the author comes to the conclusion that homo-sexual acts in animals are not so much an expression of sexual perversion as the consequence of close confinement with human beings or with the animals of the same sex. On the other hand, homo-sexual behaviour may be a simple onanism caused by enforced abstinence or by some pathological process in some part of the genito-urinary system. Inborn homo-sexuality does not occur in animals. In animals it is the *"péderastie par nécessité" but not the "péderastie par gôut."*

Pædophilia and gerontophilia were not observed among animals.

Quite different are the cases of sexual intercourse between the animals of different species: dogs and fowls, bull and mare, dogs and cats. In all these cases the animals sought to satisfy their sexual desire in a perverse manner because they were prevented from doing it in a natural way.

Masturbation and onanism occur very frequently among animals. Contrary to what is the case in the human subject, this affection in animals is caused in the majority of cases by some pathological changes of the genitalia. On the other hand, enforced idleness and isolation are a frequent cause of masturbation in stallions and bulls. Wild animals kept in captivity masturbate also.

Summary.

The demonstration of psychogenic sexual abnormalities in animals is beset with extraordinary difficulties, if not well-nigh impossible. This fact accounts for the diversity of opinions on its frequency and incidence.

To an unprejudiced mind it is quite clear that the abnormalities of this kind are not so frequent as it was assumed on many sides. Doubtless they occur very seldom, and they are limited to the paradoxia of libido, as that mainly is met with in animals, and to the isolated cases of sexual anæsthesia, hypoæsthesia and hyperæsthesia.

Proofs are lacking for the generalisation that perversions of libido occur in animals. This is especially true of the homo-sexuality and the intercourse with animals belonging to the different species. All unnatural sexual acts of animals are outward manifestations of a thwarted strong libido the inclination of which is not at all abnormal. This opinion finds support in evidence that unnatural sexual acts are performed by animals where there is no chance of its natural satisfaction, and where this is forthcoming the sexual act can and is performed naturally.

The behaviour of dogs and cattle [riding, springing and attempts at intercourse] with the individuals of the same sex, regarded as homo-sexual acts, cannot be viewed in this light, as in the majority of cases they have some pathological changes in their genitalia.

The article has appended a list of 24 references.

H. F.

Treatment of Pit Ponies.

The Secretary for Mines has informed the Mining Association of his intention to meet the representatives of certain bodies which desire to raise the subject of the employment and treatment of ponies in mines. In reply, the Mining Association has expressed the hope that Mr. Shinwell "will insist on the production of definite particulars of cases on which the allegations as to the bad treatment of pit ponies purport to be based and that he will then meet representatives of the Mining Association and furnish them with the information in question in order that they may be placed in a position to refute the unfair statements with which the public is being constantly misled as to the treatment of ponies in mines."

N.V.M.A. Divisional Report.

Western Counties Division.*

Meeting at St. Austell.

The Autumn Meeting of the above Division was held at the White Hart Hotel, St. Austell, on Wednesday, November 12th. The President, Major Wright, M.R.C.V.S., presided, and the following members were present:—Messrs. R. E. L. Penhale, W. L. Richardson, J. Forbes, E. C. Bovett, R. H. Smythe, A. R. Smythe, W. Ascott, H. W. Townson, C. Masson, J. Willis Thwaite, C. Crowhurst, F. T. Harvey, R. Barons Nelder and S. J. Motton (Hon. Secretary).

Obituary.—Before proceeding with the ordinary business of the meeting, the President said that reference must be made to the sad losses the Division had recently sustained by the deaths of two popular members, Mr. John Dunstan, of Liskeard, and Mr. Dunstan, of Okehampton; by the death of a non-member, but a very dear friend of them all, *viz.*, Mr. Holman Berry, and also by the death of a former member of the Division, Mr. Ridgman, of Liskeard. He moved that a letter of condolence be sent to the relatives, and as a mark of respect he asked the members to stand with him and observe a minute of silence.

Apologies for absence were received from Professor Hobday, Colonel Head, and Messrs. R. H. Penhale, W. B. Nelder, J. M. Penhale, A. G. Saunders, L. Norman, C. Stephens, H. K. Roberts, G. H. Gibbings, H. Fraser, P. W. Bloye, H. B. Kauntze, and E. R. Edwards.

The minutes of the last meeting, as published in the *Veterinary Record*, were taken as read, confirmed, and signed as correct.

Correspondence.—In response to a letter received from the N.V.M.A. it was decided that the County Secretaries should act as a committee for the purpose of inducing non-members of the Association to join the N.V.M.A.

A list of recent instances in which the N.V.M.A. has rendered service of value to its members and the profession was read, and met with approval.

Election of Honorary Associate.—On the proposal of Mr. Masson seconded by Mr. Motton, Major Dunkin, of the National Institute for Medical Research, was unanimously elected an Honorary Associate of the W.C.V.M.A.

Election of New Member.—On the proposal of Mr. Wright, seconded by Mr. R. E. Penhale, Captain H. W. Percy, of Kingsbridge, was unanimously elected a member of the Division.

Delegates' Report.—Reports of the delegates to the Eleventh International Veterinary Congress (Major Wright and Messrs. R. B. Nelder and S. J. Motton) were read, and a vote of thanks was accorded them, on the proposition of Major Ascott, seconded by Mr. H. W. Townson.

Paper.—Mr. E. C. Bovett, of Glastonbury, read a paper on "Some Common Conditions met with in Practice." The discussion was opened by Mr. H. W. Townson, of St. Austell. [Both paper and report of discussion are reproduced at the commencement of this issue of the *Record*.—Ed.]

On the proposal of the Hon. Secretary, seconded by Mr. R. E. L. Penhale, a very hearty vote of thanks was accorded to the essayist for producing a very practical paper, and to Mr. Townson for opening the discussion.

The President was thanked for conducting the meeting, and this terminated the business.

After the meeting, Mr. and Mrs. Townson, of St. Austell, very kindly entertained the members to tea.

S. J. Motton, *Hon. Secretary.*

Received on November 25th.

In Parliament.

The following questions and answers have been recorded in the House of Commons recently:—

Bovine Tuberculosis (Spahlinger Vaccine).

Mr. Hurd asked the Minister of Agriculture whether his attention has been called to the tests by an expert and impartial committee in Norfolk of the Spahlinger vaccine as a preventive against bovine tuberculosis; and whether his Department is making further inquiries?

Dr. Addison: Captain Richard Buxton has been good enough to present me with a summary of the report of the interesting experiments with M. Spahlinger's vaccine which have been carried out on his farm in Norfolk. I have suggested to him in the interest of all concerned in the problem that he should arrange for a complete test to be made by and under the independent control of recognised authorities who are experienced in research in this disease.

Mr. Hurd: May we take it that the former difficulty does not now exist?

Dr. Addison: I do not know to what difficulty the hon. Member refers. So far as I am concerned, we are anxious that it should be properly tested.

Lieut.-Colonel Fremantle: Is the right hon. Gentleman in touch with the Medical Research Council and the Privy Council, who are the bodies responsible for these researches?

Dr. Addison: I must ask for notice of that question.

Horse-Breeding Industry.

Sir Bertram Falle asked the Minister of Agriculture whether, in view of the tendency to restrict the use of horse traffic in certain streets in various towns throughout the country, he will investigate the serious reaction that such Orders must necessarily have upon the horse-breeding industry of this country?

Dr. Addison: My hon. Friend, the Minister of Transport, has no knowledge of the existence of a tendency to restrict by Orders the use of horse-drawn traffic in streets and, in these circumstances, the second part of the question does not arise. If, however, the hon. and gallant Member can give any specific instances of such Orders my hon. Friend will be glad to receive particulars.

Grey Squirrels (Damage).

Mr. Rosbotham asked the Minister of Agriculture whether he is aware that damage to agricultural crops and woodlands is being caused in various parts of this country by grey squirrels originally introduced here from America; and whether he will, in the interests of agriculture, discourage the practice of distributing grey squirrels which has been followed in certain cases?

Dr. Addison: The damage caused by grey squirrels has already been brought to my notice, and I am at present considering what steps can usefully be taken to give publicity to information regarding their habits, distribution and destructiveness, and the necessity for their control. I am aware that grey squirrels have, on occasions, been distributed with the intention of adding to the amenities of districts, but I am sure that it is only necessary to call attention to the destructive habits of this animal to ensure the co-operation of those concerned in an endeavour to prevent any further distribution.

Animals (Experiments).

Mr. Wardlaw-Milne asked the Secretary of State for War what animals are used in connection with experiments

made with poisonous gases at the chemical warfare experimental station at Porton; and, if so, how many of each kind?

Mr. Shaw: The figures for the year October 31st, 1929, to October 31st, 1930, were circulated in the Official Report on November 3rd last, and I am sending the hon. Member a copy.

Mr. Shaw: I would refer my hon. Friend to the answer which I gave to the hon. Member for Ayr Burghs (Lieut.-Colonel Moore) on November 3rd last, of which I am sending a copy.

Chemical Warfare Department.

Mr. Young asked the Secretary of State for War whether he will prohibit the use of horses, cats and other animals by the Chemical Warfare Department for experiments with blistering, suffocating, irritating, tear and poisonous gases?

Mr. Shaw: I would refer my hon. Friend to the answers which I gave on November 25th, to the hon. Members for Birkenhead, East (Mr. White) and Brecon and Radnor (Mr. Freeman), of which I am sending him a copy.

Mr. Young asked the Secretary of State for War the number of animals of various kinds used by the Chemical Warfare Department for experimental purposes with blistering, suffocating, irritating, and tear gases and poison gases, such as prussic acid gas, during 1929; and whether all of them were first rendered unconscious and afterwards destroyed before regaining consciousness?

Mr. Shaw: Five hundred and thirteen animals were used at the Experimental Station, Porton, and the Physiological Laboratory, Cambridge, for experiment in connection with various kind of gases in 1929. All the experiments were carried out in strict conformity with the terms and conditions of the licences and certificates held by the research workers concerned, and, as I stated in my reply to my hon. Friend the Member for Plaistow on December 4th last, the terms of those licences and certificates definitely exclude any possibility of inflicting unnecessary suffering.

Mr. Muggeridge: Cannot this particular atrocity be stopped?

Mr. Young: Do I understand the answer to mean that these animals are rendered unconscious before the experiment and killed afterwards?

Mr. Shaw: I think I must ask for notice of detailed questions. I have dealt with the question that was asked, and I have given the answer.

Mr. Ormsby-Gore: Can the right hon. Gentleman say whether any army horses have been used for the purpose of these experiments?

Mr. Shaw: I think that during the last few years a few cast horses have been used in an experimental way before they were destroyed painlessly.

Mr. Freeman: Is it a fact that certain of these poisons and drugs, like strychnine, morphia, opium and others, have an entirely different effect upon certain animals from that upon human beings and are not these experiments misleading and dangerous?

Mr. Shaw: I have already answered the question bearing on that point.

Mr. Sinkinson asked the Secretary of State for War how many horses have actually been killed by poison gas experiments at Porton each year since the cessation of the Great War?

Mr. Shaw: None, Sir.

British Army (Experimental Station, Porton).

Mr. Freeman asked the Secretary of State for War whether, in view of the fact that many drugs and poisons, such as hemlock on goats, belladonna on rabbits, opium on pigeons, lemon juice on cats and strychnine on monkeys have an entirely different effect to that on human beings, he will state what methods are used for proving that other poisons used on animals have the same effect on human beings?

The Secretary of State for War (Mr. T. Shaw): I would refer my hon. Friend to the replies which I gave him on 17th November and 25th November last. The statement that the effect of certain substances on particular animals differs from the effect on human beings affords no good ground for disregarding the connection between the effect of various gases on animals and their effect on human beings which experience in the War established.

Mr. Freeman: In view of the fact that many of these poisons have an entirely different effect on animals to that of human beings, does he not think that experiments on animals is no use as a base for experiments on human beings?

Mr. Shaw: I am not a medical man and I do not know what effect lemon juice has on cats. I have taken the best professional advice I can, I have given careful and anxious thought to the matter, and I am satisfied from the evidence that these experiments are necessary in the interests of research.

Mr. Ernest Brown: May I ask the right. hon. Gentleman whether the rabbit is the last to come out of the hat?

Mr. Shaw: I think that one is dead.

Dr. Morris-Jones: Is the right hon. Gentleman aware that hemlock has the same effect on some human beings as it has on goats?

Hon. Members: Name!

Mr. Shaw: I have heard that hemlock had a very damaging effect on Socrates.

Mr. W. J. Brown: Is the Secretary of State for War aware that there is a very large section of public opinion in this country which does not regard this as a matter for mirth—[*Interruption*]—which takes the strongest possible objection to these experiments being carried out on dumb animals?

Mr. Shaw: I am aware that there is very profound dissatisfaction with these experiments. As to the volume of that dissatisfaction, I cannot answer. I have told the House that I have not only given consideration, but anxious consideration, to the matter and I have told the House my conclusions.

Cattle Disease, Grossmont, Yorkshire.

Major Carver asked the Minister of Agriculture if his attention has been called to the disease which has killed ten cattle on the farm of Mr. Joseph Hodgson, of Grossmont, Yorkshire, the identity of which has not been found; and, if so, whether he will have the most thorough investigations made into the matter?

Dr. Addison: The disease was reported to the Ministry as pleuro-pneumonia, which is a scheduled disease under the Diseases of Animals Acts. The Ministry directed inquiries to be made in accordance with statutory requirements, and it was found that the disease was not as reported. Further investigation as to the nature and cause of the disease is being made.

Stock Sales, Terrington.

Lord Fermoy asked the Minister of Agriculture, as representing the Commissioners of Crown Lands, how much stock was sold owing to the farm at Terrington, in Norfolk, being closed down; and what was the price at which the animals were originally bought and the price at which they were disposed of on the occasion of the sale?

Dr. Addison: No farm at Terrington belonging to the Commissioners of Crown Lands has been closed down, and I presume that the Noble Lord refers to the marshland in hand recently embanked against the sea. Since August, 1929, this land has been stocked with bullocks. The total number bought since that date was 255 at a cost of £4,826. Two died and the remaining 253 have been sold at various times for £4,971.

Royal Air Force (Milk Supply).

Sir Arthur Steel-Maitland asked the Under-Secretary of State for Air whether the milk supplied to Air Force units is from cows tested for tuberculosis?

The Under-Secretary of State for Air (Mr. Montague): I assume that the question relates to supplies in this country. The tuberculin test is not applied, but milk for hospitals is supplied only by selected farms which have

been specially inspected, and under sanitary regulations as to purity which are rigidly enforced. In other cases the supply is purchased locally by units from their cash allowances, but the milk is periodically examined for purity by the station medical officers.

Sir A. Steel-Maitland: Is there such an examination or guarantee of freedom from tuberculosis exacted in regard to tinned milk or dried milk?

Mr. Montague: I cannot answer that question without notice.

Mr.* Smithers: Is the hon. Member aware that the inspection of cow-houses is quite insufficient unless the cow herself has undergone a tuberculin test?

. . . .

Humane Killer.

Commons Vote For Compulsion.

"The House of Commons gave a second reading," (on Friday of last week) says *The Times*, "to a private member's Bill making the use of the humane killer in slaughter-houses compulsory, but allowing exemptions to meet the religious scruples of Jews and Mohamedans.

"The case for the Bill was stated with great earnestness by Lieut.-Colonel Moore. He produced a humane killer, which looked like a revolver, and demonstrated how a bolt was shot into the animal's head. By this means, he argued, the animal was quickly dispatched and was saved the suffering inflicted by pole-axe or knife. He was impatient of the proposal, which had been advanced, in the form of an amendment, that the subject should be referred for investigation to a Select Committee.

"A Cabinet Committee, he pointed out, had recommended in 1923 that animals for slaughter ought in the first place to be stunned, and public sentiment was reflected in the fact that 330 local authorities had adopted the model by-laws of the Ministry of Health prescribing the use of the mechanical killer. Trade interest reinforced humane sentiment in favour of the use of this instrument; no skill was needed for its manipulation, and its use would not add to the cost of meat. The promoters justified the proposed exemption from the Bill of Jewish and Mohamedan slaughterhouses by their reluctance to offend religious susceptibilities.

Motion for Rejection.

"An amendment for the rejection of the Bill and the reference of the whole subject to a Select Committee was moved by Mr. Lang. He could not agree that the case for the Bill had been made out, and he cited the conflicting opinions concerning it which were held by many eminent people who had no trade interest to serve. Mr. Blindell supported the amendment, and pointed out that, while opinion in the trade was growing in favour of the use of the mechanical killer for the larger animals, the instrument was felt to be less effective for sheep and pigs.

Mr. Guinness declared that the case for the use of the mechanical instrument in slaughtering cattle was proved, but the bacon-curers feared that its compulsory use in the slaughterhouse might handicap their industry in its competition with foreign rivals. He suggested that the Bill ought to be passed, but with an exemption in the interests of that trade.

The Government View.

"The Minister of Health advised the promoters of the Bill to try to reach an accommodation with its opponents, otherwise they would only be at the beginning of their troubles if the measure obtained a second reading.

"The debate as it progressed proved that all members of the House were in favour of the humane method of slaughter, and in view of the Minister's statement, Mr. Lang withdrew his amendment. The Bill will therefore go before a Standing Committee for detailed consideration."

Royal College of Veterinary Surgeons.

Membership Examinations, December, 1930.

List of Successful Candidates.

Dublin.

Class A.

Adams, C. B.
*Crawford, G. J.
Finucane, M.
Hans, A. J.
O'Connor, J. S.
*Power, R. J.

Class B.

Conlon, J. B.
Crean, B. F.
Hirtes, R. E.
Pilkington, C. J.
Sweeney, James.

Class C.

Hughes, Andrew.
Jarratt, W. F.
Lambert, N. H.
McEldowney, J. P.
Reeves, P. A.

Class D.

Spears, Miss K. M.
Thompson, Alex.

* Denotes Second Class Honours.

(*To be continued.*)

Problems of a Dog's Food.

The Practical Side of a Biscuit.

(*Contributed.*)

Perhaps no more vital problem presents itself to members of the veterinary profession than the right selection of a dog's food. There are those who believe in meat, and others who do not. Then there is that section who plump wholeheartedly for dog biscuit foods, and those who believe in a combination of meat with biscuits. There is a great deal to be said for the feeding of dogs on biscuit foods only, particularly as far as the great army of one-dog owners is concerned. Research has proved conclusively that dog biscuits, which are composed of a blend of carefully selected cereals and pure meat, are rich in all the essential vitamins. It is no secret that dogs enjoy better health by the consuming of them regularly, and furthermore, that they keep teeth, gums and jaws in a healthy condition, releasing at the same time the saliva which is so essential for digestive nutrition.

Another point often overlooked is that dog biscuits provide roughage for the clean working of the intestinal organs.

It has been argued by the profession that biscuit foods are non-nutritious because of the temperature to which they are subjected in the course of baking. As a matter of fact, this is a fallacy, inasmuch as the temperature is not sufficiently high to destroy the vitamin element.

Christmas Holidays.

Messrs. Bayer Products Ltd., London, inform us that in view of the difficulty sometimes experienced by veterinary surgeons in obtaining urgently needed drugs during public holidays and after ordinary business hours, they have entered into an arrangement with Messrs. John Bell & Croyden, of 50-52 Wigmore Street, W.1, whereby the latter firm will be able to supply the profession with the Bayer veterinary preparations at any time, day or night, throughout the year.

The attention of our readers is drawn to the Bayer Co.'s announcement on this subject on page v.

Veterinarian Inventor of the Pneumatic Tyre.

John Boyd Dunlop Memorial Tablet Unveiled.

"One of the romances of industry was the discovery and development of the pneumatic tyre now used on all motor vehicles, cycles and aeroplanes. The possibilities of an air tube round a wheel were first discovered forty-three years ago by a Belfast veterinary surgeon, Mr. John Boyd Dunlop, while watching his nine-year-old son riding a solid-tyred tricycle over the rough Belfast streets of that day. His discovery was commemorated in Belfast to-day," says the *Irish Times* of Wednesday, December 10th, "when a memorial tablet was unveiled outside the premises in May Street where the first pneumatic tyre was made.

"The unveiling ceremony was performed by the Lord Mayor (Sir William Coates, Bart.), in the presence of a large attendance of those interested in the motor and tyre industries. An interesting spectator was Mrs. M'Clintock, Eastbourne, a daughter of the late Mr. Dunlop, who was present with her husband, Dr. M'Clintock, and her little daughter, Miss Jean M'Clintock.

THE TABLET.

"The inscription on the tablet was as follows:—'John Boyd Dunlop. Born 5th February, 1840. Died 23rd October, 1921. Member of the Royal College of Veterinary Surgeons. Practising in this city. Inventor and patentee of the pneumatic tyre in 1888.

"'The purchase of this invention and the subsequent development by the Dunlop Rubber Co., Ltd., inaugurated one of the largest industries in the world.

"'This tablet erected A.D. 1930.'

"The material used in the plaque is a special ebonite, capable of remaining black, and was manufactured by the Dunlop Rubber Company."

"At a subsequent luncheon in the Grand Central Hotel, Belfast, Mr. D. Telford, director of Dunlop Rubber Co. (Ireland), presided.

"The Lord Mayor, in a tribute to the late Mr. Dunlop, explained how the pneumatic tyre was discovered. He said: 'Mr. Dunlop's son John, who was then nine years of age, was the possessor of a small tricycle fitted with the usual solid rubber tyres of narrow section. While observing the manœuvres of the small boy on the tricycle, Mr. Dunlop had an inspiration. He got a small disc of wood, made an air tube of sheet rubber, and secured it to the wooden disc in a temporary fashion, with a strip or cover of linen cloth. The air tube was fitted with a non-return valve. This tyre was tested with the solid rubber one in Mr. Dunlop's business yard, and it was immediately evident that, in riding over a rough surface, the new tyre afforded greater comfort and much more speed than the solid rubber tyre.

"'Encouraged by the success of his initial experiment, Mr. Dunlop then made two very large rims and air tyres for the rear wheels of a tricycle.

"'The success of the invention being assured, Mr. Dunlop, with the assistance of a friend, had the patent protected. When the tricycle was finished Messrs. Edlin and Sinclair, from whom the machine was purchased, were invited to a practical test of the merits of the new tyre. Messrs. Edlin and Sinclair, mounted on light-running tricycles, followed Dunlop, junr., mounted on the quadrant. The route chosen for the trial was the longest and straightest macadamised thoroughfare in Belfast. Edlin and Dunlop, junr., kept abreast, but Sinclair was left far behind. Edlin was known to be a 'flier,' but at the conclusion of the trial he was considerably 'blown,' and after a spin on the pneumatic-tyred quadrant he wanted to be allowed to make one at once.

"'It may be of interest to state that the first pair of pneumatic tyres ever made were presented by Mr. Dunlop to the Governors of the Royal Scottish Museum, Edinburgh.'

"An interesting feature was the playing of a record of the voice of the late Mr. Dunlop, which was made by the late Mr. T. Edens Osborne twenty years ago."

National Greyhound Racing Society's Banquet.

The third Annual Banquet of the National Greyhound Racing Society was held at the Savoy Hotel, on December 12th under the chairmanship of Lord Askwith, K.B.C., K.C. The Chairman was supported by Major-General the Lord Loch, C.B., C.M.G., D.S.O., M.V.O., the Lord Lawrence, D.L., Air Vice-Marshal Sir Vyell Vyvyan, K.C.B., D.S.O., Admiral Sir Sydney Freemantle, G.C.B., M.V.O., Brig.-General A. C. Critchley, C.M.G., D.S.O., Alfred Short, M.P., Under-Secretary Home Office, Lt.-Colonel J. T. Moore-Brabazon M.P., Mr. Ben Tillett, M.P., Mr. McQuisten, M.P., their Worships the Mayors of West Ham and Hornchurch, and Captain E. A. Stanley and others.

The veterinary profession was adequately represented by Professor F. Hobday, C.M.G., Colonel E. Middleton Perry, Professor J. McCunn, Major Hamilton Kirk and Mr. T. C. Wight, Secretary of the Royal Veterinary College.

The popularity of the event was exemplified by the remarkable attendance of over 250 persons—an increase upon that of previous banquets of this Society.

Lord Lawrence, in his opening speech, informed the assembly that whereas in 1927 the number of the general public who had paid for admission to the 37 greyhound racetracks throughout the country was 5,000,000, this number had risen to 16 millions in 1929 and that up to the end of November, 1930, the returns showed an increase of about 800,000 over 1929. These figures formed rather a startling contrast with those of horse racing, for which only 4,000,000 people attended. "After four years it might be said that greyhound racing had now a regular following, has had other established sports, and a maintenance of these figures in the future could be expected with confidence. In short, greyhound racing had come to stay."

Very amusing speeches were delivered by Lieut.-Colonel Moore-Brabazon and Mr. Ben Tillett, both of whom expressed their staunch allegiance to greyhound racing and seemed intent upon watching its interests in the House.

London Stallion Show.

The War Office announces that a show of thoroughbred stallions will be held, in conjunction with the Hunters' Improvement and National Light Horse Breeding Society, at the Royal Agricultural Hall, Islington, on March 3rd, 4th, and 5th, 1931. A challenge cup presented by the King will be awarded for the champion stallion in the show, and a gold medal will be awarded by the War Office to the owner. Seventy-five King's Premiums (including six super-premiums) will also be offered for award by the War Office. In addition to the King's premiums a very limited number of War Office premiums will be available for award on the recommendation of the county horse-breeding committees. These awards will not be made, however, until the routes of the King's Premium stallions have been arranged. Copies of the regulations governing the award of the premiums can be had an application to the War Office.

Notes and News.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

Dec. 29th.—Meeting of the Editorial Committee, N.V.M.A., at 2 Verulam Buildings, Gray's Inn, W.C.1, 4.30 p.m.

Jan. 1st, 1931.—All changes of address to be notified to the Registrar of the R.C.V.S.

Jan. 2nd.—Meeting of the Central Division, N.V.M.A., at 10 Red Lion Square, W.C.1, 6.30 p.m.

Jan. 5th.—N.V.M.A. Committee Meetings, at 2 Verulam Buildings, Gray's Inn, W.C.1: Organising, 2 p.m.; Appointments, 2.30 p.m.; Mining Sub-Committee, 3.15 p.m.; Parliamentary, 4.15 p.m.

Jan. 6th.—N.V.M.A. Committee Meetings, at 2 Verulam Buildings, Gray's Inn, W.C.1: Joint Meeting of Veterinary Officers and Public Health and Parliamentary, 10 a.m.; Veterinary Officers and Public Health, 10.30 a.m. **N.V.M.A. Council Meeting, at** 10 Red Lion Square, W.C.1, at 2.30 p.m.

Jan. 7th.—R.C.V.S., Committee Meetings. Council of Victoria Veterinary Benevolent Fund.

Jan. 8th.—R.C.V.S., Committee Meetings. Dramatic Entertainment, organised by Lieut.-Colonel P. J. Simpson, in aid of the Victoria Veterinary Benevolent Fund, at the Rudolf Steiner Hall, Park Road, London, N.W.1.

Jan. 9th.—**R.C.V.S., Council** and Committee Meetings.

Personal.

Professor James Macqueen.

In our last issue we reported, with much regret, that Professor James Macqueen, President of the N.V.M.A. had not made sufficient progress towards recovery to render it likely that he would be able to leave the Hampstead General Hospital before Christmas. We now learn that, following an examination by a specialist, it has been decided to move him to his home in a few days, for a month or six weeks' recuperation prior to the performance of an operation, which all earnestly hope will ensure complete restoration to health.

. . . . .

Presentation to Mr. J. S. Lloyd.

At a dinner held in connection with the annual show and sale of Christmas fat stock at Wadsley Bridge Market, Sheffield, opportunity was taken to make a presentation to Mr. J. S. Lloyd, F.R.C.V.S., who recently retired from the post of Chief Veterinary Inspector to the Sheffield Corporation after 29 years' service.

The presentation took the form of a sum of money contributed by over 100 of Mr. Lloyd's friends, and was made by Major J. Abson, F.R.C.V.S., who said he was the first veterinary surgeon in Sheffield to meet Mr. Lloyd on his arrival in the city. As a matter of fact, he said, Mr. Lloyd succeeded him, for he (Major Abson) was veterinary surgeon for the borough of Sheffield for 13 or 14 years.

"I do not think anyone could accuse Mr. Lloyd of having been unfair in dealing with the problems that came before him and the many people he had to deal with," said Major Abson. "The growth of his department has been extraordinary. For the first six years he worked alone, and then he had one assistant, but from small beginnings the department has developed into one of the finest in the country. He has won the esteem and regard of the people he came in contact with in his professional capacity, from beginning to end."

Responding and expressing warm thanks for the gift, Mr. Lloyd said his health had not been good for the past nine years. He paid tribute to the work and help of his assistants. He said he always tried to do what was fair, and if he thought a man was going wrong from lack of knowledge, he tried to help him.

. . . . .

Mr. L. W. Wynn Lloyd, of Carnarvon, announces a change of address from January 1st to Dane Bank, Deganwy, North Wales.

Obituary.

Lieut.-General Sir W. Hastings Anderson, K.C.B.

In the death of Lieut.-General Sir Warren Hastings Anderson, Quartermaster-General to the Forces, after an operation for appendicitis, the Army has lost a very valued General Officer and the Army Veterinary Service a true friend. The loss is all the greater as he was shortly to take up the appointment of General Officer Commanding Aldershot Command and to which he was looking forward with great pleasure. An officer of pleasing personality, experienced in peace and war as a soldier, he was bound to make his mark had not death cut short his career at the comparatively early age of 58 years.

. . . . .

Purdy, A. L., 4 Branksome Wood Road, Bournemouth. Graduated London, December 13th, 1899. Died December 12th, 1930, age 53 years.

Erratum.—In Mr. R. H. Smythe's letter on "Tuberculin Testing" in our last issue, pp. 1158, col. 1, line 10, for "intrapalpebral" read "intradermal."

Consolidation of Public Health Legislation.

In pursuance of the policy of consolidating the various statutes regulating the work of the Ministry, the Minister of Health has appointed a committee, under the Chairmanship of Lord Chelmsford, with the following terms of reference "with a view to the consolidation of the enactments applying to England and Wales (exclusive of London) and dealing with (*a*) local authorities and local government, and (*b*) matters relating to the public health, to consider under what heads these enactments should be grouped in consolidating legislation and what amendments of the existing law are desirable for facilitating consolidation and securing simplicity, uniformity and conciseness."

Co-operation between Scientific Societies.

With the object of promoting co-operation between scientific and technical societies and institutions within the British Empire, a public company (limited by guarantee) has recently been registered. The Council consists of Sir John Cadman, Dr. A. E. Dunstan, Sir Robert Hadfield, Mr. F. W. Harbord, F.I.C., Dr. H. Levinstein, Mr. E. Macfadyen, Mr. J. A. Reavell, Professor Jocelyn F. Thorpe, Sir Arnold Wilson, Sir Hugh Bell, Lord Brotherton, Lord Wakefield, and eight others.

H.M. Stationery Office Publications.

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office, at the following addresses:—London: Adastral House, Kingsway, W.C.2, and 28, Abingdon Street, S.W.1; Cardiff: 1, St. Andrew's Crescent; Manchester: York Street; Edinburgh: 120, George Street.

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House of Lords Papers and Bills:—				
18.—Improvement of Live Stock (Licensing of Bulls) Bill (H.L.)	0	3	0	3½
4c.—Grey Seals Protection Bill (H.L.) Amendments to be moved on Report	0	1	0	1½
Health, Ministry of:—				
Public Health and Medical Subjects Reports:—				
61.—A Disease of Parrots Communicable to Man (Psittacosis). October, 1930. (32-0195-61-00)	2	6	2	8

Correspondence.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.
All correspondence must bear the name and address of the contributor for publication.
The Editor does not hold himself responsible for the opinions of his correspondents.

The Slaughter of Animals Bill.

To the Editor of The Veterinary Record.

Sir,—A letter by Mr. Dunn, M.R.C.V.S., of Hull, in last week's *Veterinary Record*, concerning the Performing Animals Act, 1925, prompts me to write you in regard to the Slaughter of Animals Bill which had a second reading in the House of Commons on December 12th.

This Bill proposes that all animals slaughtered in slaughterhouses and knackers' yards shall be instantaneously killed or stunned by a mechanical instrument.

In the event of this provision becoming law, the Act should be administered by the Veterinary Officers appointed by the Local Authorities, and if the profession do not make an effort to retain that control, the administration will fall into the hands of the lay Superintendents of the Markets and Abattoirs.

Powers are to be given to Local Authorities to licence slaughtermen to do the work and also to make a charge for the slaughtering if carried out by the Local Authority. These men should, without question, be under the control of a Veterinary Officer.

When Byelaw 9*b* of the Ministry of Health was adopted in Sheffield some time ago, we asked for the administration and control to be placed in our Department, and the Corporation did so.

Yours faithfully,
Wm. Tweed.
Acting Chief Veterinary Officer.

Veterinary Department,
Town Hall,
Sheffield.
December 15th, 1930.

The Play "The Happy Ending."

To the Editor of the Veterinary Record.

Sir,—May I beg a small space in order to apologise for the delay in the appearance of the leaflet referring to the above? All arrangements had been made with the publishers of the *Veterinary Record*, for it to have been inserted in the issue of December 13th, but for some reason, not yet satisfactorily explained, they failed to carry out the arrangement. My apology is due, in that, relying on the leaflet coming into the hands of your readers on December 13th, I posted a similar leaflet to reach other people on or about that date, giving the date of the opening of the Box Office as December 13th. This will give these people a week in which to book seats before readers of the *Record* receive notification of the date of the Play. It is to these that I wish to tender my apology, but at the same time I must disclaim any responsibility for the delay. May I add that I do hope, for the sake of our distressed members and their dependants, that all your readers will make an effort to support my very kind Maidenhead friends, by taking tickets or sending me a donation (*however small*) towards the cost of the production.

I am,
Yours truly,
P. J. Simpson, F.R.C.V.S.

"Shirley,"
Castle Hill,
Maidenhead.
December 13th, 1930.

Diagnosis of Pregnancy by Biological Test.

To the Editor of the Veterinary Record.

Sir,—We desire to procure a fairly large number of samples of urine from mares which are believed to be pregnant, to enable a particular method of determining early pregnancy to be further investigated. We would like to secure the co-operation of practitioners who number among their clients a proportion of horse-breeders. It should be understood that, in the meantime, the test is experimental, but up to date it has given reliable results, and it is highly desirable that it be applied on a much larger scale.

Already a number of personal friends among practitioners have sent us urine from mares and we would welcome more samples before pregnancy is too far advanced.

The sample required should be about three fluid ounces in amount, preferably taken in the early morning, but this is not essential. It should be sent in an ordinary four-ounce medicine bottle, which has been cleansed but not necessarily sterilised, and should reach this Department as soon as possible after being taken. (Bottles will be returned if desired.)

It would be esteemed a favour if those who find it convenient to assist in this work would send a post-card first, asking for the necessary information sheets to be sent to them.

We find it necessary to collect certain specific data regarding age of mare, breeding history and present state of health, etc., in each case, in order to enable us to interpret correctly the results of the test. This can be most conveniently supplied on the sheets we issue.

May we point out, finally, that although with the necessary modifications in the details of the technique employed, the test may be equally applicable to domesticated animals other than the horse, it is only possible, in the meantime, to test the urine from mares.

We are, Sir,
Yours faithfully,
Wm. C. Miller.
James Anderson.

Animal Breeding Research Department,
King's Buildings,
West Mains Road,
Edinburgh.
December 9th, 1930.

The Editor acknowledges the receipt of the following:—

Communications from Major Eustace Montgomery (London) and Mr. H. Taylor (Haywards Heath).

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The Veterinary Record.

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888.

NO. 52. DECEMBER 27, 1930. VOL. 10.

A Visit to Some of the Veterinary Colleges and Veterinary Research Institutes of the United Socialist Soviet Republic.*

By Frederick Hobday, C.M.G., F.R.C.V.S., F.R.S.E.
PRINCIPAL AND DEAN OF THE ROYAL VETERINARY COLLEGE, LONDON.

As some of you are aware, it has been my privilege, as Editor of the *Veterinary Journal,* to organise a series of trips by which a number of British colleagues have visited various Veterinary Colleges, Research Institutes, Municipal Abattoirs, and other concerns of veterinary interest on the Continent; and this year an exceptional opportunity afforded itself, through the courtesy of the three Soviet Delegates who responded to the invitation issued to the Government Departmental Veterinary Officials of all countries, to obtain some knowledge at first hand of what was being done to grapple with animal diseases by the Veterinary Authorities of the newly-formed Union of Socialist Soviet Republics, which was formerly known as Russia. In the Russian language this is termed "Soyus Sotsialisticheskekh Sovietskikh Respublik" and abbreviated as S.S.S.R.

This Republic comprises one-sixth of the world's surface and its size of territory is only exceeded by the domain of one nation, that of the British Empire. This fact was impressed upon me by a remark made by one of their officials, who said: "In 30 years there will be two official languages in the world—English and Russian—as you own one-fifth of the world and we own one-sixth." It extends from the Arctic Ocean to the Pacific and has every variety of climate, with most of the varieties of animal disease indigenous to each; so that, from this, one can judge in some measure of the vastness of the task to be undertaken for the control of animal disease, especially as the number of qualified veterinarians is only approximately 6,000. I was informed that it was necessary to increase this number to 12,000 as speedily as possible.

In Russia there has been for many years a system whereby there are trained (under proper Government supervision) a second grade of veterinary assistant, the so-called Feldsher, or helper, who is allowed to do certain classes of minor veterinary work on his own initiative, but whose chief function is to assist the qualified man. I was informed that this system is still carried on and that there are about 12,000 of these men practising, especially in the country districts. It is hoped to double this number within the next few years.

In the Russia of the pre-revolution days there were four veterinary colleges, each attached to a university, and these were situated at Kharkov, Kazan, Dorpat and Warsaw. After the Revolution, only Kharkov and Kazan remained, as Warsaw is situated in Poland and went with that country when it was given independence. Dorpat went similarly with Esthonia, the name being now changed to Tartu.

The Soviet Goverment, recognising the urgent value of properly trained and equipped Veterinary Science to a country whose animal health is of such vast importance, have increased the number to fourteen, all of which are already in Session, although the buildings of all are not yet quite completed.

I saw the colleges (or veterinary institutes, as they are termed) at Leningrad and Moscow. They were not quite finished in September last, but it was hoped that they would be before December—and I think (from what I saw) the prospect of their early completion was good. Those of Erivan, Voronesh, Alma Atar (in Turkestan), Troytsk (Ural), and Samara, were to be completed this year, too; and the one the outside of whose laboratories and lecture rooms I shall show you on the epidiascope is Erivan. Others are in process of erection at Kieff, Saratov, Vieteosk, Oemsk, Novocherkassk, Viatka and Perm. Besides these teaching schools there are 24 large experimental veterinary institutes, of which I saw those of Koosminky, about 12 kilometres from Moscow, and Leningrad, the photographs of which I will show you on the epidiascope screen. The two which I saw were both well equipped, and the one at Koosminky (Moscow) had over 100 acres of land attached to it for the purpose of keeping a considerable number of horses and cattle and other animals for experimental and observational purposes. Besides these, there are 68 smaller laboratories in various out-stations, used mainly as observational posts for research work.

Helminthology was made an especial study, and Moscow possessed an institute with a staff of over 30 people, under the control of Professor Skrjabin, for this subject alone. I had the opportunity of spending several hours here, and was much impressed by the thoroughness with which every detail was studied and sketched and noted down. Professor Skrjabin was one of the Soviet delegates to the International Veterinary Congress, and Dr. Schultz, his chief assistant, another delegate.

I think, however, that after these few preliminary remarks it will be the better plan for me to relate to you in order and in more detail the main incidents connected with my trip.

As it is only recently that the Soviet Republics have encouraged visitors to their country, there has been considerable difficulty in obtaining the necessary passports and permission to travel. I myself experienced this last year and the year before, but on this occasion, through the influence of the Congress Soviet delegates, my passport

* Paper presented to the Central Division, N.V.M.A., at the Royal Veterinary College, on Thursday, December 4th, 1930.

Veterinarian Inventor of the Pneumatic Tyre.

John Boyd Dunlop Memorial Tablet Unveiled.

"One of the romances of industry was the discovery and development of the pneumatic tyre now used on all motor vehicles, cycles and aeroplanes. The possibilities of an air tube round a wheel were first discovered forty-three years ago by a Belfast veterinary surgeon, Mr. John Boyd Dunlop, while watching his nine-year-old son riding a solid-tyred tricycle over the rough Belfast streets of that day. His discovery was commemorated in Belfast to-day," says the *Irish Times* of Wednesday, December 10th, "when a memorial tablet was unveiled outside the premises in May Street where the first pneumatic tyre was made.

"The unveiling ceremony was performed by the Lord Mayor (Sir William Coates, Bart.), in the presence of a large attendance of those interested in the motor and tyre industries. An interesting spectator was Mrs. M'Clintock, Eastbourne, a daughter of the late Mr. Dunlop, who was present with her husband, Dr. M'Clintock, and her little daughter, Miss Jean M'Clintock.

THE TABLET.

"The inscription on the tablet was as follows:—'John Boyd Dunlop. Born 5th February, 1840. Died 23rd October, 1921. Member of the Royal College of Veterinary Surgeons. Practising in this city. Inventor and patentee of the pneumatic tyre in 1888.

"'The purchase of this invention and the subsequent development by the Dunlop Rubber Co., Ltd., inaugurated one of the largest industries in the world.

"'This tablet erected A.D. 1930.'

"The material used in the plaque is a special ebonite, capable of remaining black, and was manufactured by the Dunlop Rubber Company."

"At a subsequent luncheon in the Grand Central Hotel, Belfast, Mr. D. Telford, director of Dunlop Rubber Co. (Ireland), presided.

"The Lord Mayor, in a tribute to the late Mr. Dunlop, explained how the pneumatic tyre was discovered. He said: 'Mr. Dunlop's son John, who was then nine years of age, was the possessor of a small tricycle fitted with the usual solid rubber tyres of narrow section. While observing the manœuvres of the small boy on the tricycle, Mr. Dunlop had an inspiration. He got a small disc of wood, made an air tube of sheet rubber, and secured it to the wooden disc in a temporary fashion, with a strip or cover of linen cloth. The air tube was fitted with a non-return valve. This tyre was tested with the solid rubber one in Mr. Dunlop's business yard, and it was immediately evident that, in riding over a rough surface, the new tyre afforded greater comfort and much more speed than the solid rubber tyre.

"'Encouraged by the success of his initial experiment, Mr. Dunlop then made two very large rims and air tyres for the rear wheels of a tricycle.

"'The success of the invention being assured, Mr. Dunlop, with the assistance of a friend, had the patent protected. When the tricycle was finished Messrs. Edlin and Sinclair, from whom the machine was purchased, were invited to a practical test of the merits of the new tyre. Messrs. Edlin and Sinclair, mounted on light-running tricycles, followed Dunlop, junr., mounted on the quadrant. The route chosen for the trial was the longest and straightest macadamised thoroughfare in Belfast. Edlin and Dunlop, junr., kept abreast, but Sinclair was left far behind. Edlin was known to be a 'flier,' but at the conclusion of the trial he was considerably 'blown,' and after a spin on the pneumatic-tyred quadrant he wanted to be allowed to make one at once.

"'It may be of interest to state that the first pair of pneumatic tyres ever made were presented by Mr. Dunlop to the Governors of the Royal Scottish Museum, Edinburgh.'

"An interesting feature was the playing of a record of the voice of the late Mr. Dunlop, which was made by the late Mr. T. Edens Osborne twenty years ago."

National Greyhound Racing Society's Banquet.

The third Annual Banquet of the National Greyhound Racing Society was held at the Savoy Hotel, on December 12th under the chairmanship of Lord Askwith, K.B.C., K.C. The Chairman was supported by Major-General the Lord Loch, C.B., C.M.G., D.S.O., M.V.O., the Lord Lawrence, D.L., Air Vice-Marshal Sir Vyell Vyvyan, K.C.B., D.S.O., Admiral Sir Sydney Freemantle, G.C.B., M.V.O., Brig.-General A. C. Critchley, C.M.G., D.S.O., Alfred Short, M.P., Under-Secretary Home Office, Lt.-Colonel J. T. Moore-Brabazon M.P., Mr. Ben Tillett, M.P., Mr. McQuisten, M.P., their Worships the Mayors of West Ham and Hornchurch, and Captain E. A. Stanley and others.

The veterinary profession was adequately represented by Professor F. Hobday, C.M.G., Colonel E. Middleton Perry, Professor J. McCunn, Major Hamilton Kirk and Mr. T. C. Wight, Secretary of the Royal Veterinary College.

The popularity of the event was exemplified by the remarkable attendance of over 250 persons—an increase upon that of previous banquets of this Society.

Lord Lawrence, in his opening speech, informed the assembly that whereas in 1927 the number of the general public who had paid for admission to the 37 greyhound racetracks throughout the country was 5,000,000, this number had risen to 16 millions in 1929 and that up to the end of November, 1930, the returns showed an increase of about 800,000 over 1929. These figures formed rather a startling contrast with those of horse racing, for which only 4,000,000 people attended. "After four years it might be said that greyhound racing had now a regular following, has had other established sports, and a maintenance of these figures in the future could be expected with confidence. In short, greyhound racing had come to stay."

Very amusing speeches were delivered by Lieut.-Colonel Moore-Brabazon and Mr. Ben Tillett, both of whom expressed their staunch allegiance to greyhound racing and seemed intent upon watching its interests in the House.

London Stallion Show.

The War Office announces that a show of thoroughbred stallions will be held, in conjunction with the Hunters' Improvement and National Light Horse Breeding Society, at the Royal Agricultural Hall, Islington, on March 3rd, 4th, and 5th, 1931. A challenge cup presented by the King will be awarded for the champion stallion in the show, and a gold medal will be awarded by the War Office to the owner. Seventy-five King's Premiums (including six super-premiums) will also be offered for award by the War Office. In addition to the King's premiums a very limited number of War Office premiums will be available for award on the recommendation of the county horse-breeding committees. These awards will not be made, however, until the routes of the King's Premium stallions have been arranged. Copies of the regulations governing the award of the premiums can be had an application to the War Office.

Notes and News.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

Dec. 29th.—Meeting of the Editorial Committee, N.V.M.A., at 2 Verulam Buildings, Gray's Inn, W.C.1, 4.30 p.m.

Jan. 1st, 1931.—All changes of address to be notified to the Registrar of the R.C.V.S.

Jan. 2nd.—Meeting of the Central Division, N.V.M.A., at 10 Red Lion Square, W.C.1, 6.30 p.m.

Jan. 5th.—N.V.M.A. Committee Meetings, at 2 Verulam Buildings, Gray's Inn, W.C.1: Organising, 2 p.m.; Appointments, 2.30 p.m.; Mining Sub-Committee, 3.15 p.m.; Parliamentary, 4.15 p.m.

Jan. 6th.—N.V.M.A. Committee Meetings, at 2 Verulam Buildings, Gray's Inn, W.C.1: Joint Meeting of Veterinary Officers and Public Health and Parliamentary, 10 a.m.; Veterinary Officers and Public Health, 10.30 a.m. **N.V.M.A. Council Meeting, at** 10 Red Lion Square, W.C.1, at 2.30 p.m.

Jan. 7th.—R.C.V.S., Committee Meetings. Council of Victoria Veterinary Benevolent Fund.

Jan. 8th.—R.C.V.S., Committee Meetings. Dramatic Entertainment, organised by Lieut.-Colonel P. J. Simpson, in aid of the Victoria Veterinary Benevolent Fund, at the Rudolf Steiner Hall, Park Road, London, N.W.1.

Jan. 9th.—**R.C.V.S., Council** and Committee Meetings.

Personal.

Professor James Macqueen.

In our last issue we reported, with much regret, that Professor James Macqueen, President of the N.V.M.A. had not made sufficient progress towards recovery to render it likely that he would be able to leave the Hampstead General Hospital before Christmas. We now learn that, following an examination by a specialist, it has been decided to move him to his home in a few days, for a month or six weeks' recuperation prior to the performance of an operation, which all earnestly hope will ensure complete restoration to health.

. . . . .

Presentation to Mr. J. S. Lloyd.

At a dinner held in connection with the annual show and sale of Christmas fat stock at Wadsley Bridge Market, Sheffield, opportunity was taken to make a presentation to Mr. J. S. Lloyd, F.R.C.V.S., who recently retired from the post of Chief Veterinary Inspector to the Sheffield Corporation after 29 years' service.

The presentation took the form of a sum of money contributed by over 100 of Mr. Lloyd's friends, and was made by Major J. Abson, F.R.C.V.S., who said he was the first veterinary surgeon in Sheffield to meet Mr. Lloyd on his arrival in the city. As a matter of fact, he said, Mr. Lloyd succeeded him, for he (Major Abson) was veterinary surgeon for the borough of Sheffield for 13 or 14 years.

"I do not think anyone could accuse Mr. Lloyd of having been unfair in dealing with the problems that came before him and the many people he had to deal with," said Major Abson. "The growth of his department has been extraordinary. For the first six years he worked alone, and then he had one assistant, but from small beginnings the department has developed into one of the finest in the country. He has won the esteem and regard of the people he came in contact with in his professional capacity, from beginning to end."

Responding and expressing warm thanks for the gift, Mr. Lloyd said his health had not been good for the past nine years. He paid tribute to the work and help of his assistants. He said he always tried to do what was fair, and if he thought a man was going wrong from lack of knowledge, he tried to help him.

. . . . .

Mr. L. W. Wynn Lloyd, of Carnarvon, announces a change of address from January 1st to Dane Bank, Deganwy, North Wales.

Obituary.

Lieut.-General Sir W. Hastings Anderson, K.C.B.

In the death of Lieut.-General Sir Warren Hastings Anderson, Quartermaster-General to the Forces, after an operation for appendicitis, the Army has lost a very valued General Officer and the Army Veterinary Service a true friend. The loss is all the greater as he was shortly to take up the appointment of General Officer Commanding Aldershot Command and to which he was looking forward with great pleasure. An officer of pleasing personality, experienced in peace and war as a soldier, he was bound to make his mark had not death cut short his career at the comparatively early age of 58 years.

. . . . .

Purdy, A. L., 4 Branksome Wood Road, Bournemouth. Graduated London, December 13th, 1899. Died December 12th, 1930, age 53 years.

Erratum.—In Mr. R. H. Smythe's letter on "Tuberculin Testing" in our last issue, pp. 1158, col. 1, line 10, for "intrapalpebral" read "intradermal."

Consolidation of Public Health Legislation.

In pursuance of the policy of consolidating the various statutes regulating the work of the Ministry, the Minister of Health has appointed a committee, under the Chairmanship of Lord Chelmsford, with the following terms of reference "with a view to the consolidation of the enactments applying to England and Wales (exclusive of London) and dealing with (*a*) local authorities and local government, and (*b*) matters relating to the public health, to consider under what heads these enactments should be grouped in consolidating legislation and what amendments of the existing law are desirable for facilitating consolidation and securing simplicity, uniformity and conciseness."

Co-operation between Scientific Societies.

With the object of promoting co-operation between scientific and technical societies and institutions within the British Empire, a public company (limited by guarantee) has recently been registered. The Council consists of Sir John Cadman, Dr. A. E. Dunstan, Sir Robert Hadfield, Mr. F. W. Harbord, F.I.C., Dr. H. Levinstein, Mr. E. Macfadyen, Mr. J. A. Reavell, Professor Jocelyn F. Thorpe, Sir Arnold Wilson, Sir Hugh Bell, Lord Brotherton, Lord Wakefield, and eight others.

H.M. Stationery Office Publications.

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office, at the following addresses:—London: Adastral House, Kingsway, W.C.2, and 28, Abingdon Street, S.W.1; Cardiff: 1, St. Andrew's Crescent; Manchester: York Street; Edinburgh: 120, George Street.

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House of Lords Papers and Bills:—				
18.—Improvement of Live Stock (Licensing of Bulls) Bill (H.L.)	0	3	0	3½
4c.—Grey Seals Protection Bill (H.L.) Amendments to be moved on Report	0	1	0	1½
Health, Ministry of:—				
Public Health and Medical Subjects Reports:—				
61.—A Disease of Parrots Communicable to Man (Psittacosis). October, 1930. (32-0195-61-00)	2	6	2	8

Correspondence.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.
All correspondence must bear the name and address of the contributor for publication.
The Editor does not hold himself responsible for the opinions of his correspondents.

The Slaughter of Animals Bill.

To the Editor of The Veterinary Record.

Sir,—A letter by Mr. Dunn, M.R.C.V.S., of Hull, in last week's *Veterinary Record*, concerning the Performing Animals Act, 1925, prompts me to write you in regard to the Slaughter of Animals Bill which had a second reading in the House of Commons on December 12th.

This Bill proposes that all animals slaughtered in slaughterhouses and knackers' yards shall be instantaneously killed or stunned by a mechanical instrument.

In the event of this provision becoming law, the Act should be administered by the Veterinary Officers appointed by the Local Authorities, and if the profession do not make an effort to retain that control, the administration will fall into the hands of the lay Superintendents of the Markets and Abattoirs.

Powers are to be given to Local Authorities to licence slaughtermen to do the work and also to make a charge for the slaughtering if carried out by the Local Authority. These men should, without question, be under the control of a Veterinary Officer.

When Byelaw 9*b* of the Ministry of Health was adopted in Sheffield some time ago, we asked for the administration and control to be placed in our Department, and the Corporation did so.

Yours faithfully,
Wm. Tweed.
Acting Chief Veterinary Officer.

Veterinary Department,
Town Hall,
Sheffield.
December 15th, 1930.

The Play "The Happy Ending."

To the Editor of the Veterinary Record.

Sir,—May I beg a small space in order to apologise for the delay in the appearance of the leaflet referring to the above? All arrangements had been made with the publishers of the *Veterinary Record*, for it to have been inserted in the issue of December 13th, but for some reason, not yet satisfactorily explained, they failed to carry out the arrangement. My apology is due, in that, relying on the leaflet coming into the hands of your readers on December 13th, I posted a similar leaflet to reach other people on or about that date, giving the date of the opening of the Box Office as December 13th. This will give these people a week in which to book seats before readers of the *Record* receive notification of the date of the Play. It is to these that I wish to tender my apology, but at the same time I must disclaim any responsibility for the delay. May I add that I do hope, for the sake of our distressed members and their dependants, that all your readers will make an effort to support my very kind Maidenhead friends, by taking tickets or sending me a donation (*however small*) towards the cost of the production.

I am,
Yours truly,
P. J. Simpson, F.R.C.V.S.

"Shirley,"
Castle Hill,
Maidenhead.
December 13th, 1930.

Diagnosis of Pregnancy by Biological Test.

To the Editor of the Veterinary Record.

Sir,—We desire to procure a fairly large number of samples of urine from mares which are believed to be pregnant, to enable a particular method of determining early pregnancy to be further investigated. We would like to secure the co-operation of practitioners who number among their clients a proportion of horse-breeders. It should be understood that, in the meantime, the test is experimental, but up to date it has given reliable results, and it is highly desirable that it be applied on a much larger scale.

Already a number of personal friends among practitioners have sent us urine from mares and we would welcome more samples before pregnancy is too far advanced.

The sample required should be about three fluid ounces in amount, preferably taken in the early morning, but this is not essential. It should be sent in an ordinary four-ounce medicine bottle, which has been cleansed but not necessarily sterilised, and should reach this Department as soon as possible after being taken. (Bottles will be returned if desired.)

It would be esteemed a favour if those who find it convenient to assist in this work would send a post-card first, asking for the necessary information sheets to be sent to them.

We find it necessary to collect certain specific data regarding age of mare, breeding history and present state of health, etc., in each case, in order to enable us to interpret correctly the results of the test. This can be most conveniently supplied on the sheets we issue.

May we point out, finally, that although with the necessary modifications in the details of the technique employed, the test may be equally applicable to domesticated animals other than the horse, it is only possible, in the meantime, to test the urine from mares.

We are, Sir,
Yours faithfully,
Wm. C. Miller.
James Anderson.

Animal Breeding Research Department,
King's Buildings,
West Mains Road,
Edinburgh.
December 9th, 1930.

The Editor acknowledges the receipt of the following:—

Communications from Major Eustace Montgomery (London) and Mr. H. Taylor (Haywards Heath).